Table of Contents

Index to Financial Statements

As filed with the Securities and Exchange Commission on June 21, 2017

Registration No. 333-

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM S-4
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

MIRNA THERAPEUTICS, INC.

(Exact name of Registrant as specified in its charter)

Delaware	2834	26-1824804
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

1250 South Capital of Texas Highway
Building 3, Suite 400
Austin, TX 78746
(512) 901-0950
(Address including zip code, and telephone number, including area code, of Registrant's principal executive offices)

Paul Lammers, M.D., M.Sc.
President & Chief Executive Officer
Mirna Therapeutics, Inc.
PO Box 163387
Austin, TX 78716
(512) 901-0950
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

Mark V. Roeder, Esq. Chad G. Rolston, Esq. Latham & Watkins LLP 140 Scott Drive Menlo Park, CA 94025 (650) 328-4600	Jose Carlos Gutierrez-Ramos, Ph.D. President & Chief Executive Officer Synlogic, Inc. 200 Sidney Street Suite 320 Cambridge, MA 02139 (617) 401-9947	Matthew J. Gardella, Esq. Lewis J. Geffen, Esq. Mintz Levin Cohn Ferris Glovsky & Popeo, P.C. One Financial Center Boston, MA 02111 (617) 542-6000

Approximate date of commencement of proposed sale to the public: As soon as practicable after the effectiveness of this registration statement and the satisfaction or waiver of all other conditions under the Merger Agreement described herein.

If the securities being registered on this Form are being offered in connection with the formation of a holding company and there is compliance with General Instruction G, please check the following box. ☐

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒ (Do not check if a smaller reporting company)	Smaller reporting company	☐
Emerging Growth Company	☒		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act ☒

If applicable, place an X in the box to designate the appropriate rule provision relied upon in conducting this transaction:

Exchange Act Rule 13(e)-4(i) (Cross-Border Issuer Tender Offer) ☐

Exchange Act Rule 14d-1(d) (Cross-Border Third-Party Tender Offer) ☐

The Registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment that specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

CALCULATION OF REGISTRATION FEE

Title of Each Class of Security Being Registered	Amount to be Registered(2)	Proposed Maximum Offering Price Per Share	Proposed Maximum Aggregate Offering Price(3)	Amount of Registration Fee(4)
Common stock, par value $0.001 per share(1)	20,170,020	N/A	$32,914,000	$3,814.73

(1) Includes rights to acquire common stock or preferred stock under any shareholder rights plan in effect from time to time, if applicable, under the terms of any such plan.

(2) Relates to common stock, $0.001 par value per share, of Mirna Therapeutics, Inc., a Delaware corporation ("Mirna") issuable to holders of common stock, $0.0001 par value per share, preferred stock, par value $0.0001 per share and options to acquire common stock of Synlogic, Inc., a Delaware corporation ("Synlogic") in the proposed merger of Meerkat Merger Sub, Inc., a Delaware corporation and a wholly owned subsidiary of Mirna, with and into Synlogic. The amount of Mirna common stock to be registered is based on the estimated number of shares of Mirna common stock that are expected to be issued pursuant to the merger after taking into account the effect of a reverse stock split of the Mirna common stock and assuming the exercise of all outstanding options to purchase Mirna common stock, resulting in a post-split exchange ratio of 0.8790 shares of Mirna common stock for each outstanding share of Synlogic common stock and Synlogic preferred stock and for each option exercisable for Synlogic common stock.

(3) Estimated solely for purposes of calculating the registration fee in accordance with Rule 457(f) of the Securities Act of 1933, as amended, based upon the estimated book value of the Synlogic securities to be exchanged in the merger, as of immediately prior to the merger. Synlogic is a private company and no market exists for its securities.

(4) This fee has been calculated pursuant to Section 6(b) of the Securities Act of 1933, as amended.

The Registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

Table of Contents

Index to Financial Statements

The information in this proxy statement/prospectus/information statement is not complete and may be changed. Mirna may not sell its securities pursuant to the proposed transactions until the Registration Statement filed with the Securities and Exchange Commission is effective. This proxy statement/prospectus/information statement is not an offer to sell these securities and is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

Subject to completion, dated June 21, 2017

PROPOSED MERGER
YOUR VOTE IS VERY IMPORTANT

To the Stockholders of Mirna Therapeutics, Inc. and Synlogic, Inc.:

Mirna Therapeutics, Inc. ("Mirna") and Synlogic, Inc. ("Synlogic") have entered into an Agreement and Plan of Merger and Reorganization (the "Merger Agreement") pursuant to which a wholly owned subsidiary of Mirna will merge with and into Synlogic, with Synlogic surviving as a wholly owned subsidiary of Mirna (the "Merger"). Mirna and Synlogic believe that the Merger will result in a specialty pharmaceutical company focused on the development and commercialization of proprietary, therapeutic products in the field of metabolic and inflammatory disease and immuno-oncology.

At the effective time of the Merger (the "Effective Time"), each share of Synlogic's common stock, par value $0.0001 per share ("Synlogic Common Stock"), and each share of Synlogic's preferred stock, par value $0.0001 per share ("Synlogic Preferred Stock," and together with the Synlogic Common Stock, the "Synlogic Capital Stock"), outstanding immediately prior to the Effective Time will be converted into the right to receive approximately 4.0807 shares of Mirna's common stock, par value $0.001 per share ("Mirna Common Stock"), subject to adjustment to account for the effect of a reverse stock split of Mirna Common Stock, at a ratio mutually agreed to by Mirna and Synlogic in the range of one new share for every five to nine shares outstanding (or any number in between), to be implemented prior to the consummation of the Merger as discussed in this proxy statement/prospectus/information statement, and further adjusted based on Mirna's net cash immediately prior to the closing of the merger (the "Exchange Ratio"). Because Mirna's net cash balance will not be determined until immediately prior to the closing of the Merger, and because the number of shares of Mirna Common Stock issuable to Synlogic is determined based on Mirna's net cash balance immediately prior to the closing of the Merger, Mirna's stockholders cannot be certain of the exact number of shares of Mirna Common Stock that will be issued to Synlogic stockholders when Mirna's stockholders vote on the proposals at the annual meeting of Mirna stockholders. Mirna will assume outstanding and unexercised options to purchase shares of Synlogic Common Stock granted under Synlogic's 2017 Stock Incentive Plan, and each such option will be converted into an option to purchase shares of Mirna Common Stock, with the number of shares of Mirna Common Stock subject to such option and the exercise price being appropriately adjusted to reflect the Exchange Ratio. Mirna Stockholders will continue to own and hold their existing shares of Mirna Common Stock. Each existing unexpired and unexercised option to purchase Mirna Common Stock (a "Mirna Option"), whether vested or unvested, will be accelerated in full pursuant to the Merger Agreement effective as of immediately prior to the Effective Time. Any Mirna Options having an exercise price per share less than the volume-weighted average closing trading price of a share of Mirna Common Stock on the NASDAQ Global Market for the five trading days ending on the trading day immediately prior to the date upon which the Merger becomes effective (the "Mirna Closing Price") will be automatically exercised. Mirna Options having an exercise price per share greater than the Mirna Closing Price will be terminated and cease to exist as of immediately prior to the Effective Time for no consideration and the shares of Mirna Common Stock underlying such Mirna Options will be returned to the Mirna 2015 Equity Incentive Award Plan.

Immediately following the consummation of the Merger, Synlogic's stockholders and optionholders are expected to own approximately 83% of the fully-diluted Mirna Common Stock, and Mirna's stockholders (including holders of shares of Mirna Common Stock received upon the automatic exercise of any Mirna Options having an exercise price per share less than the Mirna Closing Price pursuant to the Merger Agreement), are expected to own approximately 17% of the fully-diluted Mirna Common Stock, subject to adjustment of the Exchange Ratio as set forth in the Merger Agreement.

Shares of Mirna Common Stock are currently listed on the NASDAQ Global Market under the symbol "MIRN." Prior to consummation of the Merger, Mirna intends to file an initial listing application with the NASDAQ Global Market pursuant to NASDAQ "reverse merger" rules. After completion of the Merger, Mirna will be renamed "Synlogic, Inc." and expects to trade on the NASDAQ Global Market under the symbol "SYBX." On June 20, 2017, the last trading day before the date of this proxy statement/prospectus/information statement, the closing sale price of Mirna Common Stock was $1.53 per share.

Mirna is holding an annual meeting of stockholders (the "Annual Meeting") in order to obtain the stockholder approvals necessary to complete the Merger and related matters, hold an election of directors and ratify the selection of an independent registered public accounting firm. At the Annual Meeting, which will be held at [●], local time, on [●], 2017, at [●], unless postponed or adjourned to a later date, Mirna will ask Mirna's stockholders to, among other things, (i) adopt the Merger Agreement thereby approving the Merger and the issuance of Mirna Common Stock pursuant to the Merger Agreement, (ii) approve an amendment to Mirna's amended and restated certificate of incorporation effecting a reverse stock split of Mirna Common Stock at a ratio mutually agreed to by Mirna and Synlogic in the range of one new share for every five to nine shares outstanding (or any number in between) (the "Reverse Stock Split"), (iii) approve an amendment to Mirna's amended and restated certificate of incorporation changing Mirna's corporate name from "Mirna Therapeutics, Inc." to "Synlogic, Inc.," (iv) elect two Class II directors to hold office until the 2020 annual meeting of Mirna's stockholders or until their successors are elected (provided, however, that if the Merger is completed, Mirna's board of directors will be reconstituted as provided in the Merger Agreement), and (v) ratify the selection by the audit committee of the Mirna Board of Directors of Ernst & Young LLP as the independent registered public accounting firm of Mirna for its calendar year ending December 31, 2017 (provided, however, that the combined organization may decide to engage a new independent registered public accounting firm immediately or shortly after the Merger is completed), each as described in this proxy statement/prospectus/information statement.

As described in this proxy statement/prospectus/information statement, certain of Synlogic's stockholders who in the aggregate own approximately 77% of the outstanding shares of Synlogic Preferred Stock and approximately 77% of the outstanding shares of Synlogic Capital Stock on an as converted to common stock basis, and certain Mirna Stockholders who in the aggregate own approximately 33% of the outstanding shares of Mirna Common Stock, are parties to support agreements with Mirna and Synlogic, respectively, whereby such stockholders have agreed to vote in favor of the adoption or approval of the Merger Agreement, as applicable, and the approval of the transactions contemplated therein, including the Merger and the issuance of Mirna Common Stock in the Merger pursuant to the Merger Agreement, respectively, subject to the terms of the support agreements. In addition, following the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, being declared effective by the U.S. Securities and Exchange Commission and pursuant to the conditions of the Merger Agreement, Synlogic's stockholders who are party to the support agreements will each execute an action by written consent of Synlogic's stockholders, referred to herein as the written consent, adopting the Merger Agreement, thereby approving the Merger and related transactions. Therefore, holders of a sufficient number of shares of Synlogic Capital Stock required to adopt the Merger Agreement will adopt the Merger Agreement, and no meeting of Synlogic stockholders is required to adopt the Merger Agreement and approve the Merger and related transactions and no meeting of Synlogic's stockholders will be held. Nevertheless, all of Synlogic's stockholders will have the opportunity to elect to adopt the Merger Agreement, thereby approving the Merger and related transactions, by signing and returning to Synlogic a written consent.

After careful consideration, the respective boards of directors of Mirna and Synlogic have (i) determined that the transactions contemplated by the Merger Agreement are fair to, advisable and in the best interests of Mirna or Synlogic, as applicable, and their respective stockholders, (ii) approved and declared advisable the Merger Agreement and the transactions contemplated thereby and (iii) determined to recommend, upon the terms and subject to the conditions set forth in the Merger Agreement, that its stockholders vote to adopt or approve, as applicable, the Merger Agreement and, therefore, approve the transactions contemplated therein. Mirna's board of directors recommends that its stockholders vote "FOR" the proposals described in this proxy statement/prospectus/information statement, and Synlogic's board of directors recommends that its stockholders sign and return to Synlogic the written consent indicating their approval of the Merger and adoption of the Merger Agreement and related transactions.

More information about Mirna, Synlogic and the proposed transaction is contained in this proxy statement/prospectus/information statement. Mirna and Synlogic urge you to read this proxy statement/prospectus/information statement carefully and in its entirety. IN PARTICULAR, YOU SHOULD CAREFULLY CONSIDER THE MATTERS DISCUSSED UNDER THE SECTION ENTITLED "***RISK FACTORS***" IN THIS PROXY STATEMENT/PROSPECTUS/INFORMATION STATEMENT.

Mirna and Synlogic are excited about the opportunities the Merger brings to both Mirna's and Synlogic's respective stockholders, and thank you for your consideration and continued support.

Paul Lammers, M.D., M.Sc.
President and Chief Executive Officer
Mirna Therapeutics, Inc.

Jose Carlos Gutierrez-Ramos, Ph.D.
President and Chief Executive Officer
Synlogic, Inc.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this proxy statement/prospectus/information statement. Any representation to the contrary is a criminal offense.

This proxy statement/prospectus/information statement is dated June 21, 2017, and is first being mailed to Mirna's and Synlogic's respective stockholders on or about [●], 2017.

MIRNA THERAPEUTICS, INC.
1250 South Capital of Texas Highway
Building 3, Suite 400
Austin, TX 78746
(512) 901-0950

NOTICE OF ANNUAL MEETING OF STOCKHOLDERS
TO BE HELD ON

Dear Stockholders of Mirna:

On behalf of the board of directors of Mirna Therapeutics, Inc., a Delaware corporation ("Mirna"), we are pleased to deliver this proxy statement/prospectus/information statement for the proposed merger between Mirna and Synlogic, Inc., a Delaware corporation ("Synlogic"), pursuant to which Meerkat Merger Sub, Inc., a Delaware corporation and a wholly owned subsidiary of Mirna, will merge with and into Synlogic, with Synlogic surviving as a wholly owned subsidiary of Mirna (the "Merger"). The annual meeting of stockholders of Mirna (the "Annual Meeting") will be held on [●], 2017, at [●], local time, at [●], for the following purposes:

1. To consider and vote upon a proposal to approve the Agreement and Plan of Merger and Reorganization, dated as of May 15, 2017, by and among Mirna, Meerkat Merger Sub, Inc. and Synlogic, a copy of which is attached as *Annex A* to this proxy statement/prospectus/information statement (the "Merger Agreement"), and the transactions contemplated thereby, including the Merger and the issuance of shares of Mirna's common stock to Synlogic's stockholders pursuant to the terms of the Merger Agreement.
2. To approve an amendment to the amended and restated certificate of incorporation of Mirna to effect a reverse stock split of Mirna's common stock, at a ratio mutually agreed to by Mirna and Synlogic in the range of one new share for every five to nine shares outstanding (or any number in between), in the form attached as *Annex D* to this proxy statement/prospectus/information statement.
3. To approve an amendment to the amended and restated certificate of incorporation of Mirna to change the corporate name of Mirna from "Mirna Therapeutics, Inc." to "Synlogic, Inc." in the form attached as *Annex E* to this proxy statement/prospectus/information statement.
4. To elect two Class II directors to hold office until the 2020 annual meeting of Mirna's stockholders or until their successors are elected (provided, however, that if the Merger is completed, Mirna's board of directors will be reconstituted as provided in the Merger Agreement).
5. To ratify the selection by the audit committee of the Mirna Board of Directors of Ernst & Young LLP as the independent registered public accounting firm of Mirna for its calendar year ending December 31, 2017 (provided, however, that the combined organization may decide to engage a new independent registered public accounting firm immediately or shortly after the merger is completed).
6. To consider and vote upon an adjournment of the Annual Meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1 or 2.
7. To transact such other business as may properly come before the stockholders at the Annual Meeting or any adjournment or postponement thereof.

Mirna's board of directors has fixed [●], 2017, as the record date (the "Record Date") for the determination of stockholders entitled to notice of, and to vote at, the Annual Meeting and any adjournment or postponement thereof. Only holders of record of shares of Mirna's common stock at the close of business on the Record Date

are entitled to notice of, and to vote at, the Annual Meeting. At the close of business on the Record Date, there were [●] shares of Mirna's common stock outstanding and entitled to vote.

Your vote is important. The affirmative vote of the holders of a majority of the shares of Mirna's common stock having voting power present in person or represented by proxy at the Annual Meeting is required for approval of Proposal Nos. 1, 5 and 6. The affirmative vote of the holders of a majority of shares of Mirna's common stock having voting power outstanding on the Record Date for the Annual Meeting is required for approval of Proposal Nos. 2 and 3. With respect to Proposal No. 4, the two nominees receiving the most "FOR" votes (from the votes of shares present in person or represented by proxy and entitled to vote on the election of directors) will be elected. Each of Proposal Nos. 1 and 2 are conditioned upon each other. Therefore, the Merger cannot be consummated without the approval of Proposal Nos. 1 and 2.

Even if you plan to attend the Annual Meeting in person, Mirna requests that you sign and return the enclosed proxy to ensure that your shares will be represented at the Annual Meeting if you are unable to attend.

By Order of Mirna's board of directors,

Paul Lammers, M.D., M.Sc.
Mirna Therapeutics, Inc.
Austin, TX
[●], 2017

MIRNA'S BOARD OF DIRECTORS HAS DETERMINED AND BELIEVES THAT EACH OF THE PROPOSALS OUTLINED ABOVE IS ADVISABLE TO, AND IN THE BEST INTERESTS OF, MIRNA AND ITS STOCKHOLDERS AND HAS APPROVED EACH SUCH PROPOSAL. MIRNA'S BOARD OF DIRECTORS RECOMMENDS THAT MIRNA STOCKHOLDERS VOTE "FOR" EACH SUCH PROPOSAL.

REFERENCES TO ADDITIONAL INFORMATION

This proxy statement/prospectus/information statement incorporates important business and financial information about Mirna that is not included in or delivered with this document. You may obtain this information without charge through the Securities and Exchange Commission ("SEC") website (www.sec.gov) or upon your written or oral request by contacting Mirna's Corporate Secretary at Mirna Therapeutics Inc., PO Box 163387, Austin, TX 78716 or by calling (512) 901-0950.

To ensure timely delivery of these documents, any request should be made no later than [●], 2017, to receive them before the Annual Meeting.

For additional details about where you can find information about Mirna, please see the section entitled *"Where You Can Find More Information"* in this proxy statement/prospectus/information statement.

TABLE OF CONTENTS

QUESTIONS AND ANSWERS ABOUT THE MERGER

Except where specifically noted, the following information and all other information contained in this proxy statement/prospectus/information statement does not give effect to the proposed reverse stock split described in Proposal No. 2, beginning on page 187 in this proxy statement/prospectus/information statement (the "Reverse Stock Split").

The following section provides answers to frequently asked questions about the Merger. This section, however, provides only summary information. For a more complete response to these questions and for additional information, please refer to the cross-referenced sections.

Q: What is the Merger?

A: Mirna Therapeutics, Inc. ("Mirna") and Synlogic, Inc. ("Synlogic") have entered into an Agreement and Plan of Merger and Reorganization, dated as of May 15, 2017 (the "Merger Agreement"). The Merger Agreement contains the terms and conditions of the proposed business combination of Mirna and Synlogic. Under the Merger Agreement, Meerkat Merger Sub, Inc., a wholly owned subsidiary of Mirna ("Merger Sub") will merge with and into Synlogic, with Synlogic surviving as a wholly owned subsidiary of Mirna (the "Merger").

At the effective time of the Merger (the "Effective Time"), each share of Synlogic's common stock, par value $0.0001 per share ("Synlogic Common Stock"), and Synlogic's preferred stock, par value $0.0001 per share ("Synlogic Preferred Stock," and together with Synlogic Common Stock, "Synlogic Capital Stock") outstanding immediately prior to the Effective Time (excluding certain shares to be canceled pursuant to the Merger Agreement, and shares held by stockholders who have exercised and perfected appraisal rights or dissenters' rights as more fully described in the section of this proxy statement/prospectus/information statement entitled *"The Merger—Appraisal Rights and Dissenters' Rights"*) will be converted into the right to receive approximately 4.0807 shares of Mirna's common stock, par value $0.001 per share ("Mirna Common Stock"), subject to adjustment to account for the Reverse Stock Split, and further adjusted based on Mirna's net cash immediately prior to the closing (the "Closing") of the Merger (the "Exchange Ratio"). Because Mirna's net cash balance will not be determined until the Closing, and because the number of shares of Mirna Common Stock issuable to Synlogic is determined based on Mirna's net cash balance at Closing, Mirna Stockholders cannot be certain of the exact number of shares that will be issued to Synlogic's stockholders when Mirna's stockholders vote on the proposals at the annual meeting of stockholders of Mirna stockholders (the "Annual Meeting"). The Exchange Ratio is an estimate only and the final Exchange Ratio will be determined pursuant to a formula described in more detail in the Merger Agreement and in the attached proxy statement/prospectus/information statement. As a result of the Merger, current holders of shares of Synlogic Capital Stock including shares of Synlogic Common Stock that, immediately prior to the Effective Time, are unvested by virtue of being subject to a repurchase option or a risk of forfeiture under any applicable restricted stock purchase agreement or other similar agreement with Synlogic ("Synlogic Restricted Stock," and each holder of Synlogic Capital Stock, including Synlogic Restricted Stock, a "Synlogic Stockholders") and holders of options to purchase shares of Synlogic Common Stock (each a "Synlogic Option" and each holder of a Synlogic Option a "Synlogic Optionholder") are expected to own, or hold rights to acquire, in the aggregate approximately 83% of Mirna Common Stock on a fully-diluted basis and current stockholders of Mirna ("Mirna Stockholders") (including holders of shares of Mirna Common Stock received upon the automatic exercise, pursuant to the Merger Agreement, of any unexpired and unexercised option to purchase Mirna Common Stock (a "Mirna Option") having an exercise price per share less than the volume weighted average closing trading price of a share of Mirna Common Stock on the NASDAQ Global Market for the five trading days ending on the trading day immediately prior to the date upon which the Merger becomes effective (the "Mirna Closing Price")) are expected to own in the aggregate approximately 17% of Mirna Common Stock on a fully-diluted basis and, in each case, following the Effective Time and subject to adjustment of the Exchange

Ratio. After the consummation of the Merger, and assuming Mirna Stockholders approve Proposal No. 3, Mirna will change its corporate name to "Synlogic, Inc." as required by the Merger Agreement (the "Mirna Name Change").

Q: What will happen to Mirna if, for any reason, the Merger does not close?

A: If, for any reason, the Merger does not close, the board of directors of Mirna (the "Mirna Board of Directors") may elect to, among other things, attempt to complete another strategic transaction like the Merger, attempt to sell or otherwise dispose of the various assets of Mirna or continue to operate the business of Mirna. If the Mirna Board of Directors decides to dissolve and liquidate Mirna's assets, Mirna would be required to pay all of its debts and contractual obligations, and to set aside certain reserves for potential future claims. There can be no assurances as to the amount or timing of available cash left to distribute to Mirna Stockholders after paying the debts and other obligations of Mirna and setting aside funds for reserves.

If Mirna were to continue its business, Mirna's management would need to identify, acquire and develop other products or product candidates as there are no current plans to, and Mirna's management and the Mirna Board of Directors does not believe it is in the best interest of Mirna to, pursue development of Mirna's current product candidates. In addition, as of May 31, 2017, the Mirna workforce was comprised of five employees, all of whom are involved in financial and administrative roles. Mirna has ceased all further research activities and completed all activity related to ongoing clinical trials. If the Mirna Board of Directors decides to reestablish Mirna's business and/or pursue development of other products or product candidates, Mirna will need to rebuild its senior management team and hire managerial and other personnel to lead and staff all of its necessary functions, especially its research, development and commercialization areas.

Q: Why are the two companies proposing to merge?

A: Synlogic and Mirna believe that the Merger will result in a specialty pharmaceutical company focused on the development and commercialization of proprietary, therapeutic products in the field of metabolic and inflammatory disease and immuno-oncology. For a discussion of Mirna's and Synlogic's reasons for the Merger, please see the section entitled *"The Merger—Mirna Reasons for the Merger"* and *"The Merger—Synlogic Reasons for the Merger"* in this proxy statement/prospectus/information statement.

Q: Why am I receiving this proxy statement/prospectus/information statement?

A: You are receiving this proxy statement/prospectus/information statement because you have been identified as a Mirna Stockholder or Synlogic Stockholder as of the applicable record date, and you are entitled, as applicable, to (i) vote at the Annual Meeting to approve the Merger Agreement and the transactions contemplated thereby, including the Merger and the issuance of shares of Mirna Common Stock pursuant to the Merger Agreement, or (ii) sign and return the Synlogic written consent to adopt the Merger Agreement and approve the transactions contemplated thereby, including the Merger. This document serves as:

- a proxy statement of Mirna used to solicit proxies for the Annual Meeting;
- a prospectus of Mirna used to offer shares of Mirna Common Stock in exchange for shares of Synlogic Capital Stock in the Merger and issuable upon exercise of options to purchase Mirna Common Stock, as applicable; and
- an information statement of Synlogic used to solicit the written consent of Synlogic Stockholders for the adoption of the Merger Agreement and the approval of the Merger and related transactions.

Q: What is required to consummate the Merger?

A: To consummate the Merger, Mirna Stockholders must approve the issuance of Mirna Common Stock pursuant to the Merger Agreement (Proposal No. 1) and an amendment to the amended and restated

certificate of incorporation of Mirna effecting the Reverse Stock Split (Proposal No. 2) and Synlogic Stockholders must adopt the Merger Agreement and, thereby, approve the Merger and the other transactions contemplated by the Merger Agreement.

The approval of the Merger and the issuance of Mirna Common Stock pursuant to the Merger Agreement by the Mirna Stockholders requires the affirmative vote of the holders of a majority of the shares of Mirna Common Stock having voting power present in person or represented by proxy at the Annual Meeting. The approval of the amendments to the amended and restated certificate of incorporation of Mirna to effect the Reverse Stock Split and the Mirna Name Change requires the affirmative vote of the holders of a majority of shares of Mirna Common Stock having voting power outstanding on [●], 2017 (the "Record Date") . The approval of the Reverse Stock Split is required in order to authorize Mirna's issuance of the shares of Mirna Common Stock pursuant to the Merger Agreement and avoid a delisting of Mirna Common Stock from the NASDAQ Global Market. Therefore, if the requisite Mirna Stockholders approve the Merger and the issuance of Mirna Common Stock pursuant to the Merger Agreement but do not approve the Reverse Stock Split, the Merger will not be consummated.

The adoption of the Merger Agreement and the approval of the Merger and related transactions by the Synlogic Stockholders requires the affirmative vote (or written consent) of the holders of a majority of (a) the outstanding shares of Synlogic Common Stock and Synlogic Preferred Stock, voting together as one class and (b) the holders of a majority of the outstanding shares of Synlogic Preferred Stock voting as a separate class. In addition to the requirement of obtaining such stockholder approvals and appropriate regulatory approvals, each of the other closing conditions set forth in the Merger Agreement must be satisfied or waived.

The presence, in person or represented by proxy, at the Annual Meeting of the holders of a majority of the shares of Mirna Common Stock outstanding and entitled to vote at the Annual Meeting is necessary to constitute a quorum at the meeting. Abstentions and broker non-votes will be counted toward a quorum. The affirmative vote of a majority of the votes cast in person or by proxy at the Annual Meeting, assuming a quorum is present, is required for approval of Proposal No. 1. The affirmative vote of the holders of a majority of the shares of Mirna Common Stock having voting power outstanding on the Record Date is required for approval of Proposal Nos. 2 and 3. Each of Proposal Nos. 1 and 2 are conditioned upon each other and the approval of each such proposal is a condition to the completion of the Merger. Therefore, the Merger cannot be consummated without the approval of Proposal Nos. 1 and 2.

Votes will be counted by the inspector of election appointed for the meeting, who will separately count "FOR," "AGAINST" and "WITHHOLD" votes, abstentions and broker non-votes. Abstentions and broker non-votes will be treated as shares present for the purpose of determining the presence of a quorum for the transaction of business at the Annual Meeting. Abstentions and broker non-votes will not, however, be considered votes cast at the Annual Meeting and will therefore not have any effect with respect to Proposal No. 1. Abstentions and broker non-votes will have the same effect as a vote "AGAINST" Proposal Nos. 2 and 3.

As of May 31, 2017, certain Synlogic Stockholders who in the aggregate own approximately 77% of the outstanding shares of Synlogic Preferred Stock and approximately 77% of the outstanding shares of Synlogic Capital Stock on an as converted to common stock basis, and certain Mirna Stockholders who in the aggregate own approximately 33% of the outstanding shares of Mirna Common Stock, are parties to support agreements with Mirna and Synlogic, respectively, whereby such stockholders have agreed to vote their shares in favor of the adoption or approval, as applicable, of the Merger Agreement and the transactions contemplated therein, including the Merger and the issuance of Mirna Common Stock to Synlogic Stockholders pursuant to the Merger Agreement, subject to the terms of the support agreements. In addition, following the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, being declared effective by the U.S. Securities and Exchange Commission (the "SEC") and pursuant to the conditions of the Merger Agreement, Synlogic Stockholders who are party to the support agreements will each execute written consents approving the Merger and related transactions.

Therefore, holders of a sufficient number of shares of Synlogic Capital Stock required to adopt the Merger Agreement, thereby approving the Merger, have agreed to adopt the Merger Agreement via written consent. Synlogic Stockholders, including those who are parties to support agreements, are being requested to execute written consents providing such approvals.

For a more complete description of the closing conditions under the Merger Agreement, Mirna urges you to read the section entitled *"The Merger Agreement—Conditions to the Completion of the Merger"* in this proxy statement/prospectus/information statement.

Q: What proposals are to be voted on at the Annual Meeting, other than the proposals required in connection with the Merger?

A: At the Annual Meeting, the Mirna Stockholders will also be asked to consider the following proposals, along with any other business that may properly come before the Annual Meeting or any adjournment or postponement thereof:

- Proposal No. 4 to elect two Class II directors to hold office until the 2020 annual meeting of Mirna Stockholders or until their successors are elected (provided, however, that if the Merger is completed, the board of directors will be reconstituted as provided in the Merger Agreement);
- Proposal No. 5 to ratify the selection of Ernst & Young LLP as Mirna's independent registered public accounting firm for the calendar year ending December 31, 2017 (provided, however, that it is likely that the combined organization may decide to engage a new independent registered public accounting firm immediately or shortly after the Merger is completed); and
- Proposal No. 6 to approve an adjournment of the Annual Meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1 or 2.

The approval of Proposal Nos. 4 and 5 are not conditions to the Merger. Such proposals, together with Proposal Nos. 1, 2, 3 and 6, are referred to collectively in this proxy statement/prospectus/information statement as the proposals.

Mirna Stockholders should understand, however, that if the Merger is completed, the effect of the approval of Proposal Nos. 4 and 5 will be limited since the composition of the Mirna Board of Directors will be changed upon completion of the Merger in accordance with the Merger Agreement and the combined organization may decide to engage a new independent registered public accounting firm immediately or shortly after completion of the Merger.

The election of Class II directors to the Mirna Board of Directors requires a plurality of the votes cast at the Annual Meeting. The approval of the proposal to ratify the selection of an independent registered public accounting firm for the calendar year ending December 31, 2017 requires the affirmative vote of a majority of the votes cast in person or by proxy (not counting "abstentions" or "broker non-votes" as votes cast), assuming a quorum is present, at the Annual Meeting.

The presence, in person or represented by proxy, at the Annual Meeting of the holders of a majority of the shares of Mirna Common Stock outstanding and entitled to vote at the Annual Meeting is necessary to constitute a quorum at the meeting. Abstentions and broker non-votes will be counted toward a quorum. The affirmative vote of a majority of the votes cast in person or by proxy at the Annual Meeting, assuming a quorum is present, is required for approval of Proposal Nos. 5 and 6. With respect to Proposal No. 4, the two nominees receiving the most "FOR" votes (from the votes of shares present in person or represented by proxy and entitled to vote on the election of directors) will be elected. Broker non-votes will not be counted towards the vote total for Proposal No. 4.

Votes will be counted by the inspector of election appointed for the Annual Meeting, who will separately count "FOR," "AGAINST" and "WITHHOLD" votes, abstentions and broker non-votes. "WITHHOLD" votes with respect to the election of one or more nominees for director pursuant to Proposal No. 4 will not

be voted with respect to the director or directors indicated, although they will be counted for purposes of determining the presence of a quorum for the transaction of business at the Annual Meeting. Abstentions and broker non-votes will also be treated as shares present for the purpose of determining the presence of a quorum for the transaction of business at the Annual Meeting. Abstentions and broker non-votes will not, however, be considered votes cast at the Annual Meeting and will therefore not have any effect with respect to Proposal Nos. 5 and 6.

As of May 31, 2017, the directors and executive officers of Mirna beneficially owned approximately 20% of the outstanding shares of Mirna Common Stock entitled to vote at the Annual Meeting, including 14% of the outstanding shares of Mirna Common Stock which are beneficially owned by funds affiliated with a venture capital firm with which one of Mirna's directors is affiliated. Additionally, one venture capital firms with which one of Mirna's directors is affiliated owned approximately 14% of the shares of Mirna Common Stock entitled to vote at the Annual Meeting. As of May 31, 2017, Mirna is not aware of any affiliate of Synlogic owning any shares of Mirna Common Stock entitled to vote at the Annual Meeting.

Q: What will Synlogic Stockholders and Synlogic Optionholders receive in the Merger?

A: As a result of the Merger, Synlogic Stockholders (including holders of Synlogic Restricted Stock) and Synlogic Optionholders will become entitled to receive shares, or rights to acquire shares, of Mirna Common Stock equal to, in the aggregate, approximately 83% of the outstanding Mirna Common Stock on a fully-diluted basis. Any shares of Mirna Common Stock that are issued in exchange for shares of Synlogic Restricted Stock will be unvested and subject to a repurchase option or risk of forfeiture to the same extent as the shares of Synlogic Restricted Stock immediately prior to the Effective Time. Following the Closing, Synlogic Optionholders will have their Synlogic Options converted into options to purchase shares of Mirna Common Stock, with the number of shares of Mirna Common Stock subject to such option and the exercise price being appropriately adjusted to reflect the Exchange Ratio between Mirna Common Stock and Synlogic Capital Stock determined in accordance with the Merger Agreement.

For a more complete description of what Synlogic Stockholders and Synlogic Optionholders will receive in the Merger, please see the sections entitled *"The Merger Agreement—Merger Consideration"* in this proxy statement/prospectus/information statement.

Q: Who will be the directors of Mirna following the Merger?

A: Following the consummation of the Merger, the size of the Mirna Board of Directors will be maintained to include a total of seven directors. Pursuant to the terms of the Merger Agreement, the Mirna Board of Directors will be reconstituted such that four of directors will be designated by Synlogic, two directors will be designated by Mirna, and one director will be an independent designee designated by Synlogic. It is anticipated that, following the Closing, the Mirna Board of Directors will be constituted as follows:

Name	Current Principal Affiliation
Peter Barrett	Synlogic, Inc., Chairman
Jose Carlos Gutierrez-Ramos	Synlogic, Inc., Director
Chau Q. Khuong	Synlogic, Inc., Director
Nick Leschly	Synlogic, Inc., Director
Edward Mathers	Mirna Therapeutics, Inc., Director
Michael Powell	Mirna Therapeutics, Inc., Director
Synlogic Designee	

Q: Who will be the executive officers of Mirna immediately following the Merger?

A: Immediately following the consummation of the Merger, the executive management team of Mirna is expected to be composed solely of the members of Synlogic's executive management team prior to the Merger:

Name	Title
Jose Carlos Gutierrez-Ramos	President & Chief Executive Officer
Todd Shegog	Chief Financial Officer
Aoife M. Brennan	Chief Medical Officer
Paul Miller	Chief Scientific Officer
Richard Schwartz	Senior Vice President, Process Development and Manufacturing
Caroline B. Kurtz	Head of Translational Sciences and Product Development

Q: What are the material U.S. federal income tax consequences of the Reverse Stock Split?

A: The Reverse Stock Split should constitute a "recapitalization" for U.S. federal income tax purposes. As a result, a U.S. Holder (as defined in the section of this proxy statement/prospectus/information statement entitled "*Matters Being Submitted to a Vote of Mirna Stockholders—Mirna Proposal No. 2: Approval of the Amended and Restated Certificate of Incorporation of Mirna Effecting the Reverse Stock Split—Material U.S. Federal Income Tax Consequences of the Reverse Stock Split*") of Mirna Common Stock generally should not recognize gain or loss upon the Reverse Stock Split, except with respect to cash received in lieu of a fractional share of Mirna Common Stock, as discussed in the section of this proxy statement/prospectus/information statement entitled "*Matters Being Submitted to a Vote of Mirna Stockholders—Mirna Proposal No. 2: Approval of the Amended and Restated Certificate of Incorporation of Mirna Effecting the Reverse Stock Split—Material U.S. Federal Income Tax Consequences of the Reverse Stock Split.*" A U.S. Holder's aggregate tax basis in the shares of Mirna Common Stock received pursuant to the Reverse Stock Split should equal the aggregate tax basis of the shares of the Mirna Common Stock surrendered (excluding any portion of such basis that is allocated to any fractional share of Mirna Common Stock), and such U.S. Holder's holding period in the shares of Mirna Common Stock received should include the holding period in the shares of Mirna Common Stock surrendered. Treasury Regulations provide detailed rules for allocating the tax basis and holding period of the shares of Mirna Common Stock surrendered to the shares of Mirna Common Stock received in a recapitalization pursuant to the Reverse Stock Split. U.S. Holders of shares of Mirna Common Stock acquired on different dates and at different prices should consult their tax advisors regarding the allocation of the tax basis and holding period of such shares. For more information, please see the section of this proxy statement/prospectus/information statement entitled "*Matters Being Submitted to a Vote of Mirna Stockholders—Mirna Proposal No. 2: Approval of the Amended and Restated Certificate of Incorporation of Mirna Effecting the Reverse Stock Split—Material U.S. Federal Income Tax Consequences of the Reverse Stock Split*."

Q: What are the material U.S. federal income tax consequences of the transaction?

A: Mirna and Synlogic intend the Merger to qualify as a reorganization within the meaning of Section 368(a) of the Internal Revenue Code of 1986, as amended (the "Code"), as described in the section entitled *"The Merger—Material United States Federal Income Tax Consequences of the Merger"* in this proxy statement/prospectus/information statement. Assuming the Merger constitutes a reorganization, subject to the limitations and qualifications described in the section entitled *"The Merger—Material United States Federal Income Tax Consequences of the Merger"* in this proxy statement/prospectus/information statement, Synlogic Stockholders generally should not recognize gain or loss for U.S. federal income tax purposes on the receipt of shares of Mirna Common Stock issued in connection with the Merger (other than in respect of cash received in lieu of fractional shares). Each Synlogic Stockholder who receives cash in lieu of a fractional share of Mirna Common Stock will be treated for U.S. federal income tax purposes as having

received such fractional share pursuant to the Merger and then as having exchanged such fractional share for cash in a redemption by Mirna. A Synlogic Stockholder should generally recognize gain or loss on such a deemed exchange of the fractional share.

If the Merger is not treated as a reorganization under Section 368(a) of the Code, then, subject to the limitations and qualifications described in the section entitled *"The Merger—Material United States Federal Income Tax Consequences of the Merger"* in this proxy statement/prospectus/information statement, each Synlogic Stockholder will generally recognize gain or loss, for U.S. federal income tax purposes, on the receipt of shares of Mirna Common Stock issued to such Synlogic Stockholder and on any cash received in lieu of fractional shares in connection with the Merger. The tax consequences to each Synlogic Stockholder will depend on that stockholder's particular circumstances. Each Synlogic Stockholder should consult with his, her or its tax advisor for a full understanding of the tax consequences of the Merger to that stockholder.

Q: As a Mirna Stockholder, how does the Mirna Board of Directors recommend that I vote?

A: After careful consideration, the Mirna Board of Directors recommends that Mirna Stockholders vote:

- "FOR" Proposal No. 1 to approve the Merger Agreement and the transactions contemplated thereby, including the Merger and the issuance of shares of Mirna Common Stock to Synlogic Stockholders in the Merger;
- "FOR" Proposal No. 2 to approve an amendment to the amended and restated certificate of incorporation of Mirna to effect the Reverse Stock Split;
- "FOR" Proposal No. 3 to approve an amendment to the amended and restated certificate of incorporation of Mirna to effect the Mirna Name Change;
- "FOR" Proposal No. 4 to elect each of the Class II nominees for director to hold office until the 2020 annual meeting of Mirna Stockholders or until their successors are elected;
- "FOR" Proposal No. 5 ratify the selection by the audit committee of the Mirna Board of Directors of Ernst & Young LLP as the independent registered public accounting firm of Mirna for its calendar year ending December 31, 2017; and
- "FOR" Proposal No. 6 to adjourn the Annual Meeting, if necessary, if a quorum is present, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1 or 2.

Q: As a Synlogic Stockholder, how does the Synlogic Board of Directors recommend that I vote?

A: After careful consideration, the board of directors of Synlogic (the "Synlogic Board of Directors") recommends that Synlogic Stockholders execute the written consent indicating their vote in favor of the adoption of the Merger Agreement and the approval of the Merger and the transactions contemplated by the Merger Agreement.

Q: What risks should I consider in deciding whether to vote in favor of the Merger or to execute and return the written consent, as applicable?

A: You should carefully review the section of this proxy statement/prospectus/information statement entitled *"Risk Factors,"* which sets forth certain risks and uncertainties related to the Merger, risks and uncertainties to which the combined organization's business will be subject, and risks and uncertainties to which each of Mirna and Synlogic, as independent companies, are subject.

Q: Who can vote at the Annual Meeting?

A: Only Mirna Stockholders of record at the close of business on the Record Date, [●], 2017, will be entitled to vote at the Annual Meeting. As of [●], 2017, there were [●] shares of Mirna Common Stock outstanding and entitled to vote.

Stockholder of Record: Shares Registered in Your Name

If, at the close of business on the Record Date, your shares of Mirna Common Stock were registered directly in your name with Mirna's transfer agent, American Stock Transfer & Trust Company, LLC, then you are a Mirna Stockholder of record. As a Mirna Stockholder of record, you may vote in person at the Annual Meeting or vote by proxy. Whether or not you plan to attend the Annual Meeting, please vote as soon as possible by completing and returning the enclosed proxy card or vote by proxy over the telephone or on the internet as instructed below to ensure your vote is counted.

Beneficial Owner: Shares Registered in the Name of a Broker or Bank

If, at the close of business on the Record Date, your shares of Mirna Common Stock were not held in your name, but rather in an account at a brokerage firm, bank, dealer or other similar organization, then you are the beneficial owner of shares held in "street name" and these proxy materials are being forwarded to you by that organization. The organization holding your account is considered to be the stockholder of record for purposes of voting at the Annual Meeting. As a beneficial owner, you have the right to direct your broker or other agent how to vote the shares in your account. You are also invited to attend the Annual Meeting. However, because you are not the stockholder of record, you may not vote your shares in person at the Annual Meeting unless you request and obtain a valid proxy from your broker or other agent.

Q: How many votes do I have?

A: On each matter to be voted upon, you have one vote for each share of Mirna Common Stock you own as of the Record Date.

Q: What is the quorum requirement?

A: A quorum of stockholders is necessary to hold a valid meeting. A quorum will be present if stockholders holding at least a majority of the outstanding shares entitled to vote are present at the Annual Meeting. On [●], 2017, there were [●] shares of Mirna Common Stock outstanding and entitled to vote. Accordingly, Mirna expects that the holders of at least [●] shares of Mirna Common Stock must be present at the Annual Meeting for a quorum to exist. Your shares of Mirna Common Stock will be counted toward the quorum at the Annual Meeting only if you attend the Annual Meeting in person or are represented at the Annual Meeting by proxy.

Abstentions and broker non-votes (as described below) will be counted towards the quorum requirement. If there is no quorum, the holders of a majority of shares present and entitled to vote at the meeting in person or represented by proxy may adjourn the Annual Meeting to another date.

Q: What are "broker non-votes"?

A: If you hold shares beneficially in street name and do not provide your broker or other agent with voting instructions, your shares may constitute "broker non-votes." Broker non-votes occur on a matter when a broker is not permitted to vote on that matter without instructions from the beneficial owner and instructions are not given. These matters are referred to as "non-routine" matters. Proposals Nos. 1, 2, 3 and 4 are non-routine matters, but Proposal No. 5, to ratify the selection of the independent registered public accounting firm, is a "routine" matter. Broker non-votes will not be counted toward the vote total for any proposal at the Annual Meeting.

Q: How can I find out the results of the voting at the Annual Meeting?

A: Mirna will disclose final voting results in a Current Report on Form 8-K filed with the SEC within four business days after the Annual Meeting. If final voting results are unavailable at that time, then Mirna intends to file a Current Report on Form 8-K to disclose preliminary voting results and file an amended Current Report on Form 8-K within four business days after the date the final voting results are available.

Q: When are stockholder proposals due for next year's annual meeting?

A: To be considered for inclusion in the proxy materials for the 2018 annual meeting of Mirna Stockholders, your proposal must be submitted in writing by [●], 2017 to Mirna's Corporate Secretary at Mirna Therapeutics Inc., PO Box 163387, Austin, TX 78716. However, if the meeting is more than 30 days from [●], 2018, then the deadline for stockholder proposals will be a reasonable time before Mirna begins to print and mail the proxy materials before the meeting.

If you wish to submit a proposal before the stockholders or nominate a director at the 2018 annual meeting of Mirna Stockholders, but you are not requesting that your proposal or nomination be included in the proxy materials for that meeting, then you must follow the procedures set forth in Mirna's bylaws and, among other things, notify Mirna's Corporate Secretary in writing between [●], 2018 and [●], 2018. However, if the date of the 2018 annual meeting of Mirna Stockholders is more than 30 days before or more than 60 days after [●], 2018, then you must give notice no later than the 90th day prior to that meeting or, if later, the 10th day following the day on which public disclosure of that annual meeting date is first made. You are also advised to review Mirna's bylaws, which contain additional requirements regarding advance notice of stockholder proposals and director nominations.

Q: When do you expect the Merger to be consummated?

A: Mirna and Synlogic anticipate that the Merger will occur sometime soon after the Annual Meeting to be held on [●], 2017, but the companies cannot predict the exact timing. For more information, please see the section entitled *"The Merger Agreement—Conditions to the Completion of the Merger"* in this proxy statement/prospectus/information statement.

Q: What do I need to do now?

A: Mirna and Synlogic urge you to read this proxy statement/prospectus/information statement carefully, including its annexes, and to consider how the Merger affects you.

If you are a Mirna Stockholder of record, you may provide your proxy instructions in one of two different ways. First, you can mail your signed proxy card in the enclosed return envelope. You may also provide your proxy instructions via telephone or via the Internet by following the instructions on your proxy card or voting instruction form. Please provide your proxy instructions only once, unless you are revoking a previously delivered proxy instruction, and as soon as possible so that your shares can be voted at the Annual Meeting.

If you are a Synlogic Stockholder, you may execute and return your written consent to Synlogic in accordance with the instructions provided.

Q: What happens if I do not return a proxy card or otherwise provide proxy instructions, as applicable?

A: If you are a Mirna Stockholder, the failure to return your proxy card or otherwise provide proxy instructions will reduce the aggregate number of votes required to approve Proposal No. 1, 4, 5 and 6 and will have the same effect as voting against Proposal Nos. 2 and 3 and your shares will not be counted for purposes of determining whether a quorum is present at the Annual Meeting.

Q: May I vote in person at the Annual Meeting?

A: If your shares of Mirna Common Stock are registered directly in your name with Mirna's transfer agent, you are considered to be the stockholder of record with respect to those shares, and the proxy materials and proxy card are being sent directly to you by Mirna. If you are a Mirna Stockholder of record, you may attend the Annual Meeting and vote your shares in person. Even if you plan to attend the Annual Meeting in person, Mirna requests that you sign and return the enclosed proxy to ensure that your shares will be

represented at the Annual Meeting if you are unable to attend. If your shares of Mirna Common Stock are held in a brokerage account or by another nominee, you are considered the beneficial owner of shares held in "street name," and the proxy materials are being forwarded to you by your broker or other agent together with a voting instruction card. As the beneficial owner, you are also invited to attend the Annual Meeting. Because a beneficial owner is not the stockholder of record, you may not vote your shares of Mirna Common Stock in person at the Annual Meeting unless you obtain a proxy from the broker, trustee or nominee that holds your shares, giving you the right to vote the shares at the Annual Meeting.

Q: When and where is the Annual Meeting?

A: The Annual Meeting will be held at [●], at [●], local time, on [●], 2017. Subject to space availability, all Mirna Stockholders as of the Record Date, or their duly appointed proxies, may attend the Annual Meeting. Since seating is limited, admission to the Annual Meeting will be on a first-come, first-served basis. Registration and seating will begin at [●], local time.

Q: If my Mirna shares are held in "street name" by my broker, will my broker vote my shares for me?

A: Unless your broker has discretionary authority to vote on certain matters, your broker will not be able to vote your shares of Mirna Common Stock without instructions from you. Brokers are not expected to have discretionary authority to vote for Proposal Nos. 1, 2, 3 or 4. To make sure that your vote is counted, you should instruct your broker to vote your shares, following the procedures provided by your broker.

Q: May I change my vote after I have submitted a proxy or provided proxy instructions?

A: Mirna Stockholders of record, other than those Mirna Stockholders who are parties to support agreements, may change their vote at any time before their proxy is voted at the Annual Meeting in one of three ways. First, a Mirna Stockholder of record can send a written notice to the Secretary of Mirna stating that it would like to revoke its proxy. Second, a Mirna Stockholder of record can submit new proxy instructions either on a new proxy card or via the Internet. Third, a Mirna Stockholder of record can attend the Annual Meeting and vote in person. Attendance alone will not revoke a proxy. If a Mirna Stockholder of record or a stockholder who owns shares of Mirna Common Stock in "street name" has instructed a broker to vote its shares of Mirna Common Stock, the stockholder must follow directions received from its broker to change those instructions.

Q: Who is paying for this proxy solicitation?

A: Mirna and Synlogic will share equally the cost of printing and filing this proxy statement/prospectus/information statement and the proxy card. Arrangements will also be made with brokerage firms and other custodians, nominees and fiduciaries who are record holders of Mirna Common Stock for the forwarding of solicitation materials to the beneficial owners of Mirna Common Stock. Mirna will reimburse these brokers, custodians, nominees and fiduciaries for the reasonable out-of-pocket expenses they incur in connection with the forwarding of solicitation materials.

Q: Who can help answer my questions?

A: If you are a Mirna Stockholder and would like additional copies, without charge, of this proxy statement/prospectus/information statement or if you have questions about the Merger, including the procedures for voting your shares, you should contact:

Mirna Therapeutics, Inc.
PO Box 163387
Austin, TX 78745
Tel: (512) 901-0900
Attn: Alan Fuhrman, Chief Financial Officer

If you are a Synlogic Stockholder, and would like additional copies, without charge, of this proxy statement/prospectus/information statement or if you have questions about the Merger, including the procedures for voting your shares, you should contact:

Synlogic, Inc.
200 Sidney St., Suite 320
Cambridge, MA 02139
Tel: (617) 401-9947
Attn: Christina Tartaglia

PROSPECTUS SUMMARY

This summary highlights selected information from this proxy statement/prospectus/information statement and may not contain all of the information that is important to you. To better understand the Merger, the proposals being considered at the Annual Meeting and Synlogic Stockholder actions that are the subject of the written consent, you should read this entire proxy statement/prospectus/information statement carefully, including the Merger Agreement attached as Annex A, the opinion of Wedbush Securities Inc. ("Wedbush") attached as Annex B and the other annexes to which you are referred herein. For more information, please see the section entitled "Where You Can Find More Information" in this proxy statement/prospectus/information statement.

The Companies

Mirna Therapeutics, Inc.

Mirna Therapeutics, Inc.
PO Box 163387
Austin, TX 78716
(512) 901-0900

Mirna is a biopharmaceutical company that has focused on the development of microRNA-based oncology therapeutics, which are short ribonucleic acid molecules, or oligonucleotides. Mirna's operations have historically focused on developing its understanding of and capabilities in microRNA biology, identifying potential product candidates, undertaking pre-clinical studies, and initiating and conducting a clinical trial, protecting and enhancing Mirna's intellectual property portfolio and providing general and administrative support for these activities. Mirna's first product candidate, MRX34, the first microRNA mimic to enter clinical development in oncology, was studied as a single agent in a multicenter Phase 1 clinical trial. In September 2016, Mirna voluntarily halted enrollment and dosing in the clinical trial following multiple immune-related serious adverse events ("SAEs") observed in patients dosed with MRX34 over the course of the trial. Subsequently, the U.S. Food and Drug Administration ("FDA") notified Mirna that the Investigational New Drug Application ("IND") for MRX34 was placed on full clinical hold. Mirna has since closed the IND and focused on evaluating strategic alternatives, including the Merger.

Synlogic, Inc.

Synlogic, Inc.
200 Sidney Street, Suite 320
Cambridge, MA 02139
(617) 401-9947

Synlogic™ is pioneering the development of Synthetic Biotic™ medicines: a novel class of living medicines intended to treat a broad range of human diseases, ranging from genetic and acquired metabolic disorders to inflammation and cancer. Synthetic Biotic medicines are generated from Synlogic's proprietary drug discovery and development platform. Synlogic applies the principles and tools of synthetic biology to engineer beneficial probiotic bacteria to perform or deliver critical therapeutic functions, compensating for missing or damaged pathways in patients with these serious diseases. As living medicines, Synthetic Biotic medicines are designed to sense a local disease context within a patient's body and to respond by metabolizing toxic substances or delivering combinations of therapeutic factors.

Synlogic's two lead programs target a group of rare metabolic diseases, inborn errors of metabolism. Patients with these diseases are born with a faulty gene, inhibiting the body's ability to break down commonly occurring byproducts of digestion that then accumulate to toxic levels and cause serious health consequences.

Synlogic's lead Synthetic Biotic medicines are designed to be orally administered and act from the gut to compensate for the dysfunctional metabolic pathway and have the intended consequence of clearing the toxic metabolite from systemic circulation and tissues. In this way, Synthetic Biotic medicines are engineered for specific metabolic diseases and have the potential to significantly improve the quality of life for affected patients.

Synlogic's lead Synthetic Biotic program, SYNB1020, is in a Phase 1 clinical trial as an oral treatment for patients with hyperammonemic conditions, such as Urea Cycle Disorders and hepatic encephalopathy in liver disease patients—both conditions in which ammonia accumulates in the body and becomes toxic leading to long-term cognitive or behavioral impairment, coma, or death. Synlogic's second program, SYNB1618, is intended as an oral therapy for phenylketonuria, in which phenylalanine accumulates in the body as a result of genetic defects, becoming toxic to the brain and leading to neurological dysfunction.

In addition, Synlogic is leveraging the broad potential of its platform to create Synthetic Biotic medicines for the treatment of more common diseases, such as liver disease, inflammatory and immune disorders, and cancer, where combinations of therapeutics are becoming common, and a platform with inherent capability to perform and deliver multiple complementary mechanisms may have an advantage. Synlogic is collaborating with AbbVie S.à.r.l. ("AbbVie") to develop Synthetic Biotic-based treatments for inflammatory bowel disease.

Meerkat Merger Sub, Inc.

Merger Sub is a wholly owned subsidiary of Mirna, and was formed solely for the purposes of carrying out the Merger.

The Merger (see page 90)

If the Merger is completed, Merger Sub will merge with and into Synlogic, with Synlogic surviving as a wholly owned subsidiary of Mirna.

At the Effective Time, each share of Synlogic Capital Stock (including shares of Synlogic Restricted Stock) outstanding immediately prior to the Effective Time (excluding certain shares to be canceled pursuant to the Merger Agreement, and shares held by stockholders who have exercised and perfected appraisal rights or dissenters' rights as more fully described in the section entitled "*The Merger—Appraisal Rights and Dissenters' Rights*" in this proxy statement/prospectus/information statement) will be converted into the right to receive approximately 4.0807 shares of Mirna Common Stock, subject to adjustment to account for the Reverse Stock Split, and further adjustment based on Mirna's net cash immediately prior to the Closing. Because Mirna's net cash balance will not be determined until immediately prior to the Closing, and because the number of shares of Mirna Common Stock issuable to Synlogic Stockholders is determined based on Mirna's net cash balance immediately prior to Closing, Mirna Stockholders cannot be certain of the exact number of shares of Mirna Common Stock that will be issued to Synlogic Stockholders when Mirna Stockholders vote on the proposals at the Annual Meeting. This Exchange Ratio is an estimate only and final Exchange Ratio will be determined pursuant to a formula described in more detail in the Merger Agreement and in this proxy statement/prospectus/information statement. Immediately following the consummation of the Merger, subject to adjustments to reflect certain events that could occur prior to Closing, current Synlogic Stockholders and Synlogic Optionholders are expected to own, or hold rights to acquire, approximately 83% of the fully-diluted Mirna Common Stock, with current Mirna Stockholders (including holders of shares of Mirna Common Stock received upon the automatic exercise, pursuant to the Merger Agreement, of any Mirna Options having an exercise price per share less than the Mirna Closing Price) are expected to own approximately 17% of the fully-diluted Mirna Common Stock, in each case subject to adjustment of the Exchange Ratio. Any shares of Mirna Common Stock that are issued in exchange for shares of Synlogic Restricted Stock will be unvested and subject to a repurchase option or risk of forfeiture to the same extent as the shares of Synlogic Restricted Stock immediately prior to the Effective Time. Mirna will assume all outstanding and unexercised Synlogic Options, and each such Synlogic Option will be

converted into an option to purchase shares of Mirna Common Stock, with the number of shares of Mirna Common Stock subject to such option and the exercise price being appropriately adjusted to reflect the Exchange Ratio. The percentages set forth above assume that the Exchange Ratio is not adjusted, however the Exchange Ratio is subject to adjustment as described in the section entitled "*The Merger Agreement—Merger Consideration and Adjustment*" in this proxy statement/prospectus/information statement.

For a more complete description of the Merger and the Exchange Ratio please see the section entitled "*The Merger Agreement*" in this proxy statement/prospectus/information statement.

The Closing will occur no later than the second business day after the last of the conditions to the Merger has been satisfied or waived (other than those conditions that by their nature are to be satisfied at the closing, but subject to the satisfaction or waiver of each such conditions), or at such other time as Mirna and Synlogic agree. Mirna and Synlogic anticipate that the consummation of the Merger will occur in the third quarter of the calendar year. However, because the Merger is subject to a number of conditions, neither Mirna nor Synlogic can predict exactly when the Closing will occur or if it will occur at all. After completion of the Merger, assuming that Mirna receives the required stockholder approval of Proposal No. 3, Mirna will be renamed "Synlogic, Inc."

Reasons for the Merger

Following the Merger, the combined organization will be a clinical-stage biopharmaceutical company focused on advancing Synlogic's drug discovery and development platform for Synthetic Biotic medicines, which are designed using synthetic biology to genetically reprogram beneficial microbes to treat metabolic and inflammatory diseases and cancer. Mirna and Synlogic believe that the combined organization will have the following potential advantages:

- *Emerging Development-Stage Company*. Synlogic is focused on discovering and developing Synthetic Biotic medicines capable of sensing a patient's internal environment and responding by turning an engineered metabolic pathway on or off in order to achieve a desired therapeutic effect. These Synthetic Biotic medicines are being developed to treat inflammatory diseases, cancer and metabolic conditions. Synlogic initiated a Phase 1 healthy volunteers study for its lead candidate, SYNB1020, in June 2017.
- *Management Team*. It is expected that the combined organization will be led by the experienced senior management team from Synlogic and a board of directors of seven members with representation from each of Mirna and Synlogic.
- *Cash Resources*. The combined organization is expected to have at least $95.0 million in cash and cash equivalents at the Closing, which Mirna and Synlogic believe is sufficient to enable Synlogic to pursue its near term clinical trials and business plans.

Each of the boards of directors of Mirna and Synlogic also considered other reasons for the Merger, as described herein. For example, the Mirna Board of Directors considered, among other things:

- the strategic alternatives to the Merger available to Mirna, including the discussions that Mirna's management and the Mirna Board of Directors previously conducted with other potential merger partners;
- the failure of MRX34 or any other drug candidates in Mirna's portfolio to show success in clinical trials and the unlikelihood that such circumstances would change for the benefit of Mirna Stockholders in the foreseeable future;
- the risk associated with, and uncertain value and costs to Mirna Stockholders of, liquidating Mirna;

- the risks of continuing to operate Mirna on a stand-alone basis, including the need to rebuild infrastructure and management to continue its operations; and
- the opportunity as a result of the Merger for Mirna Stockholders to participate in the potential value of Synlogic's product candidate portfolio and the potential growth of the combined organization following the Merger.

In addition, the Synlogic Board of Directors approved the Merger based on a number of factors, including the following:

- the potential increased access to sources of capital and a broader range of investors to support the clinical development of its products than it could otherwise obtain if it continued to operate as a privately held company;
- the potential to provide its current stockholders with greater liquidity by owning stock in a public company;
- the Synlogic Board of Directors's belief that no alternatives to the Merger were reasonably likely to create greater value for Synlogic Stockholders after reviewing the various strategic options to enhance stockholder value that were considered by the Synlogic Board of Directors and the likelihood of achieving any alternative transaction compared to the likelihood of completing the Merger;
- the cash resources of the combined organization expected to be available at the Closing relative to the anticipated burn rate of the combined organization; and
- the expectation that the Merger will be treated as a reorganization for U.S. federal income tax purposes.

Opinion of the Mirna Financial Advisor (see page 108)

The Mirna Board of Directors engaged Wedbush Securities Inc. ("Wedbush") to provide strategic advisory and investment banking services in connection with evaluating and considering various strategic alternatives, and ultimately requested that Wedbush render an opinion as to whether the consideration to be paid by Mirna in the Merger, as provided in the Merger Agreement, was fair, from a financial point of view, to the Mirna Stockholders. At the May 15, 2017 meeting of the Mirna Board of Directors, Wedbush rendered its oral opinion, subsequently confirmed by delivery of a written opinion dated May 15, 2017, to the Mirna Board of Directors that, as of the date of such opinion, and based upon the assumptions made, procedures followed, matters considered, and qualifications and limitations of the review set forth in its written opinion, the consideration to be paid by Mirna in the Merger was fair, from a financial point of view, to the Mirna Stockholders. For purposes of Wedbush's opinion, the term "consideration" means the total number of shares of Mirna Common Stock to be issued in the Merger.

The full text of Wedbush's written opinion, which sets forth the procedures followed, assumptions made, matters considered, and qualifications and limitations of the review undertaken in connection with the opinion, is attached to this proxy statement/prospectus/information statement as *Annex B* and is incorporated by reference in its entirety to this proxy statement/prospectus/information statement. Wedbush's opinion was intended solely for the benefit and use of the Mirna Board of Directors (in its capacity as such) in connection with its consideration of the Merger. Wedbush's opinion was not intended to be used for any other purpose without Wedbush's prior written consent in each instance, except as expressly provided for in the engagement letter between Mirna and Wedbush. Wedbush has consented to the use of Wedbush's opinion in this proxy statement/prospectus/information statement. Wedbush's opinion did not address Mirna's underlying business decision to enter into the Merger Agreement or complete the Merger or the merits of the Merger as compared to any alternative transactions that were or may be available to Mirna, and did not constitute a recommendation to the Mirna Board of Directors or to any Mirna Stockholder as to how such stockholder should vote with respect to the Merger or otherwise.

Overview of the Merger Agreement

Merger Consideration (see page 131)

At the Effective Time, all outstanding shares of Synlogic Capital Stock shall convert into the right to receive Mirna Common Stock as follows:

- each share of Synlogic Capital Stock outstanding immediately prior to the Effective Time (including any shares of Synlogic Restricted Stock, but excluding shares of Synlogic Common Stock held as treasury stock or held by Synlogic, Merger Sub or any subsidiary of Synlogic and excluding shares held by stockholders who have exercised and perfected appraisal rights or dissenters' rights as more fully described in the section entitled "The Merger—Appraisal Rights and Dissenters' Rights" in this proxy statement/prospectus/information statement) will automatically be converted into the right to receive a number of shares of Mirna Common Stock equal to 4.0807 (as adjusted to account for the Reverse Stock Split, if consummated, and further as adjusted based on Mirna's net cash immediately prior to Closing); and
- immediately after the Merger, based on the Exchange Ratio, current Synlogic Stockholders and Synlogic Optionholders are expected to own, or hold rights to acquire, approximately 83% of the fully-diluted Mirna Common Stock with current Mirna Stockholders (including holders of shares of Mirna Common Stock received upon the automatic exercise, pursuant to the Merger Agreement, of any Mirna Options having an exercise price per share less than the Mirna Closing Price) expected to own approximately 17% of the fully-diluted Mirna Common Stock. The approximate post-closing ownership percentages in this paragraph assume that Mirna will have $40 million in net cash immediately prior to Closing. Accordingly, such percentages are subject to change based upon the final Exchange Ratio as set forth in the Merger Agreement.

Treatment of Synlogic Restricted Stock

Any shares of Mirna Common Stock that are issued in exchange for shares of Synlogic Restricted Stock will be unvested and subject to a repurchase option or risk of forfeiture to the same extent as the shares of Synlogic Restricted Stock immediately prior to the Effective Time. Synlogic will take all actions that may be necessary to ensure that, from and after the Effective Time, Mirna is entitled to exercise any such repurchase option or right set forth in any restricted stock purchase agreement or other agreement to which such shares of Synlogic Restricted Stock are subject.

Treatment of Synlogic Options (see page 142)

Pursuant to the Merger Agreement, at the Effective Time, each Synlogic Option that is outstanding and unexercised immediately prior to the Effective Time granted under the Synlogic 2017 Stock Incentive Plan, whether or not vested, will be assumed by Mirna and will become an option to purchase that number of shares of Mirna Common Stock equal to the product obtained by multiplying (i) the number of shares of Synlogic Common Stock that were subject to such Synlogic Option immediately prior to the Effective Time by (ii) the Exchange Ratio, and rounding the resulting number down to the nearest whole number of shares of Mirna Common Stock. The per share exercise price for shares of Mirna Common Stock issuable upon exercise of each Synlogic Option assumed by Mirna shall be determined by dividing (a) the per share exercise price of Synlogic Common Stock subject to such Synlogic Option, as in effect immediately prior to the Effective Time, by (b) the Exchange Ratio, and rounding the resulting exercise price up to the nearest whole cent. Any restriction on the exercise of any Synlogic Option assumed by Mirna will continue in full force and effect and the term, exercisability, vesting schedule and other provisions of such Synlogic Option shall otherwise remain unchanged.

Treatment of Mirna Options (see page 142)

Prior to the Closing, the Mirna Board of Directors will adopt appropriate resolutions and take all other actions necessary and appropriate to provide that each Mirna Option, whether vested or unvested, will be accelerated in full effective as of immediately prior to the Effective Time. Effective as of the Effective Time, each outstanding and unexercised Mirna Option having an exercise price per share less than the Mirna Closing Price will be automatically exercised in full and, in exchange therefor, each holder of any such automatically exercised Mirna Options will be entitled to receive a number of shares of Mirna Common Stock calculated by dividing (a) the product of (i) the total number of shares of Mirna Common Stock previously subject to such Mirna Option, and (ii) the excess of the Mirna Closing Price over the exercise price per share of the Mirna Common Stock previously subject to such Mirna Option by (b) the Mirna Closing Price. Each outstanding and unexercised Mirna Option that has an exercise price equal to or greater than the Mirna Closing Price will be terminated and cease to exist as of immediately prior to the Effective Time for no consideration and the shares of Mirna Common Stock underlying the unexercised Mirna Options will be returned to the Mirna 2015 Equity Incentive Award Plan (the "Mirna 2015 Plan").

Conditions to the Completion of the Merger (see page 143)

To consummate the Merger, Mirna Stockholders must approve (a) the Merger Agreement and the transactions contemplated thereby, including the Merger and the issuance of shares of Mirna Common Stock to Synlogic Stockholders in the Merger, and (b) an amendment to the amended and restated certificate of incorporation of Mirna effecting the Reverse Stock Split. Additionally, Synlogic Stockholders must adopt the Merger Agreement thereby approving the Merger and the other transactions contemplated by the Merger Agreement. In addition to obtaining such stockholder approvals and obtaining appropriate regulatory approvals, each of the other closing conditions set forth in the Merger Agreement must be satisfied or waived.

No Solicitation (see page 147)

Each of Mirna and Synlogic have agreed that, except as described below, Mirna and Synlogic and any of their respective subsidiaries will not, nor will either party or any of its subsidiaries authorize any of the directors, officers, employees, agents, attorneys, accountants, investment bankers, advisors or representatives retained by it or any of its subsidiaries to, directly or indirectly:

- solicit, initiate or knowingly encourage, induce or facilitate the communication, making, submission or announcement of, any "Acquisition Proposal" (as defined in the section of this proxy statement/prospectus/information statement entitled "*The Merger Agreement—No Solicitation*"), or "Acquisition Inquiry" (as defined in the section of this proxy statement/prospectus/information statement entitled "*The Merger Agreement—No Solicitation*");
- furnish any non-public information with respect to it to any person in connection with or in response to an Acquisition Proposal or Acquisition Inquiry;
- engage in discussions or negotiations with any person with respect to any Acquisition Proposal or Acquisition Inquiry;
- approve, endorse or recommend an Acquisition Proposal; or
- execute or enter into any letter of intent or similar document or any contract contemplating or otherwise relating to an Acquisition Transaction (as defined in the section of this proxy statement/prospectus/information statement entitled "*The Merger Agreement—No Solicitation*").

Termination (see page 152)

Either Mirna or Synlogic can terminate the Merger Agreement under certain circumstances, which would prevent the Merger from being consummated.

Termination Fee (see page 154)

If the Merger Agreement is terminated under certain circumstances, Mirna or Synlogic will be required to pay the other party a termination fee of $2.0 million and, in some circumstances, reimburse the other party for expenses incurred in connection with the Merger, up to a maximum of $1.0 million.

Support Agreements (see page 157)

Certain Synlogic Stockholders are party to a support agreement with Mirna pursuant to which, among other things, each of these stockholders agreed, solely in his, her or its capacity as a Synlogic Stockholder, to vote all of his, her or its shares of Synlogic Capital Stock in favor of the adoption of the Merger Agreement and the approval of any other matter necessary to consummate the transactions contemplated by the Merger Agreement that are considered and voted upon by Synlogic Stockholders and against any Acquisition Proposal. The parties to the support agreements with Mirna include all directors and executive officers of Synlogic and certain major stockholders of Synlogic, including Atlas Venture Fund IX, L.P., New Enterprise Associates 14, L.P., OrbiMed Private Investments VI, L.P. and Deerfield Private Design Fund III, L.P.

As of May 31, 2017, the Synlogic Stockholders that are party to a support agreement with Mirna owned an aggregate of 3,861,498 shares of Synlogic Common Stock and 14,649,540 shares of Synlogic Preferred Stock, representing approximately 77% of the outstanding shares of Synlogic Capital Stock on an as converted to common stock basis. These stockholders include only executive officers and directors of Synlogic and certain stockholders owning more than 5% of the outstanding shares of Synlogic Capital Stock. Following the effectiveness of the registration statement of which this proxy statement/prospectus/information statement is a part, Synlogic Stockholders holding a sufficient number of shares of Synlogic Capital Stock to adopt the Merger Agreement and thereby approve the Merger will execute written consents providing for such adoption and approval.

Certain Mirna Stockholders are party to a support agreement with Synlogic pursuant to which, among other things, each of these stockholders agreed, solely in his, her or its capacity as a Mirna Stockholder, to vote all of his, her or its shares of Mirna Common Stock in favor of approval of (i) the Merger Agreement and the transactions contemplated thereby, including the Merger and the issuance of shares of Mirna Common Stock to Synlogic Stockholders, (ii) an amendment to the amended and restated certificate of incorporation of Mirna to effect the Reverse Stock Split, (iii) an amendment to the amended and restated certificate of incorporation of Mirna to effect the Mirna Name Change, (iv) any proposal to adjourn or postpone the meeting to a later date, if there are not sufficient votes for the approval of the other matters to be approved on date of the Annual Meeting, and (v) any other matter necessary to consummate the transactions contemplated by the Merger Agreement that are considered and voted upon by Mirna Stockholders at the Annual Meeting and against any Acquisition Proposal.

The Mirna Stockholders that are party to a support agreement with Synlogic beneficially owned an aggregate of 7,061,006 shares of Mirna Common Stock, representing approximately 33% of the outstanding shares of Mirna Common Stock as of May 31, 2017. These stockholders include executive officers and directors of Mirna and certain stockholders owning more than 5% of the outstanding shares of Mirna Common Stock. The parties to the support agreements with Synlogic are as follows:

- Sofinnova Venture Partners VIII, L.P.
- New Enterprise Associates 14, L.P.
- Lawrence M. Alleva
- Paul Lammers, M.D., M.Sc.

- Edward Mathers
- Michael Powell, Ph.D.
- Matthew Winkler, Ph.D.

The support agreements are discussed in greater detail in the section entitled "*Agreements Related to the Merger—Support Agreements and Written Consent*" in this proxy statement/prospectus/information statement.

Lock-up Agreements (see page 158)

As a condition to the Closing, certain Mirna Stockholders and Synlogic Stockholders have entered into lock-up agreements, pursuant to which such parties have agreed not to, except in limited circumstances, sell or transfer, or engage in swap or similar transactions with respect to, shares of Mirna Common Stock, including, as applicable, shares received in the Merger and issuable upon exercise of certain options, in each case from the Closing until the date that is 180 days from the Closing.

As of May 31, 2017, Mirna Stockholders who have executed lock-up agreements beneficially owned in the aggregate approximately 33% of the outstanding shares of Mirna Common Stock.

Synlogic Stockholders who have executed lock-up agreements as of May 31, 2017 owned in the aggregate approximately 81% of the outstanding shares of Synlogic Capital Stock on an as converted into common stock basis.

Management Following the Merger (see page 285)

Effective as of the Closing, Mirna's officers are expected to include:

Name	Title
Jose Carlos Gutierrez-Ramos	President & Chief Executive Officer
Todd Shegog	Chief Financial Officer
Aoife M. Brennan	Chief Medical Officer
Paul Miller	Chief Scientific Officer
Richard Schwartz	Senior Vice President, Process Development and Manufacturing
Caroline B. Kurtz	Head of Translational Sciences and Product Development

Interests of Certain Directors, Officers and Affiliates of Mirna and Synlogic (see pages 117 and 128)

In considering the recommendation of the Mirna Board of Directors with respect to issuing shares of Mirna Common Stock pursuant to the Merger Agreement and the other matters to be acted upon by Mirna Stockholders at the Annual Meeting, Mirna Stockholders should be aware that certain members of the Mirna Board of Directors and executive officers of Mirna have interests in the Merger that may be different from, or in addition to, interests they have as Mirna Stockholders. For example, Mirna has entered into certain change in control severance agreements with each of its current executive officers that may result in the receipt by such executive officers of cash severance payments and other benefits with a total value of approximately $1.9 million (collectively, not individually, and excluding the value of any accelerated vesting of Mirna Options) and the accelerated vesting of Mirna Options held by those officers, based on data available as of May 31, 2017 and assuming a covered termination of employment of each executive officer's employment as of such date.

As of May 31, 2017, the directors and executive officers of Mirna beneficially owned, in the aggregate approximately 20% of the outstanding shares of Mirna Common Stock, including 14% of the outstanding shares

of Mirna Common Stock which are beneficially owned by funds affiliated with Sofinnova Venture Partners, L.P., an investment fund with which one of Mirna's directors is affiliated. Additionally 14% of the outstanding shares of Mirna Common Stock are beneficially owned by funds affiliated with New Enterprise Associates 14, L.P. an investment firm with which one of Mirna's directors is affiliated. Certain of Mirna's officers and directors, and their affiliates, have also entered into support agreements in connection with the Merger. The support agreements are discussed in greater detail in the section entitled "*Agreements Related to the Merger—Support Agreements and Written Consent*" in this proxy statement/prospectus/information statement.

In considering the recommendation of the Synlogic Board of Directors with respect to approving the Merger and related transactions by written consent, Synlogic Stockholders should be aware that certain members of the Synlogic Board of Directors and certain executive officers of Synlogic have interests in the Merger that may be different from, or in addition to, interests they have as Synlogic Stockholders. For example, certain of Synlogic's directors and executive officers have options, subject to vesting, to purchase shares of Synlogic Common Stock which, at Closing, shall be converted into and become options to purchase shares of Mirna Common Stock; certain of Synlogic's directors and executive officers are expected to become directors and executive officers of Mirna upon the Closing; and all of Synlogic's directors and executive officers are entitled to certain indemnification and liability insurance coverage pursuant to the terms of the Merger Agreement.

As of May 31, 2017, all directors and executive officers of Synlogic, together with their affiliates, owned approximately 35% of the outstanding shares of Synlogic Capital Stock, on an as converted to common stock basis. Certain of Synlogic's officers and directors, and their affiliates, have also entered into support agreements in connection with the Merger. The support agreements are discussed in greater detail in the section entitled "*Agreements Related to the Merger—Support Agreements and Written Consent*" in this proxy statement/prospectus/information statement.

Material U.S. Federal Income Tax Consequences of the Merger (see page 135)

As discussed in detail in the section entitled *"The Merger—Material United States Federal Income Tax Consequences of the Merger"* in this proxy statement/prospectus/information statement, Mirna and Synlogic intend the Merger to qualify as a reorganization within the meaning of Section 368(a) of the Code. If the Merger is not treated as a reorganization within the meaning of Section 368(a) of the Code, then each U.S. holder generally will be treated as exchanging its shares Synlogic Capital Stock in a fully taxable transaction in exchange for shares of Mirna Common Stock. Synlogic Stockholders will generally recognize gain or loss in such exchange equal to the amount that such Synlogic Stockholder's adjusted tax basis in the shares of Synlogic Capital Stock surrendered is less or more than the fair market value of the shares of Mirna Common Stock (and cash in lieu of a fractional share) received in exchange therefor. Determining the actual tax consequences of the Merger to you may be complex and will depend on the facts of your own situation. You should consult your tax advisors to fully understand the tax consequences to you of the Merger, including estate, gift, state, local or non-U.S. tax consequences of the Merger.

Risk Factors (see page 30)

Both Mirna and Synlogic are subject to various risks associated with their businesses and their industries. In addition, the Merger poses a number of risks to each company and its respective stockholders, including the possibility that the Merger may not be completed and the following risks:

- the Exchange Ratio is not adjustable based on the market price of Mirna Common Stock, so the merger consideration at the Closing may have a greater or lesser value than at the time the Merger Agreement was signed;

- failure to complete the Merger may result in Mirna or Synlogic paying a termination fee or expenses to the other and could harm the per share price of Mirna Common Stock and future business and operations of each company;
- the Merger may be completed even though material adverse changes may result solely from the announcement of the Merger, general economic or political conditions or conditions generally affecting the industries in which Mirna and Synlogic operate and other causes;
- some Mirna and Synlogic officers and directors have interests that are different from or in addition to those considered by stockholders of Mirna and Synlogic and which may influence them to support or approve the Merger;
- the market price of Mirna Common Stock may decline as a result of the Merger;
- Mirna Stockholders and Synlogic Stockholders may not realize a benefit from the Merger commensurate with the ownership dilution they will experience in connection with the Merger;
- during the pendency of the Merger, Mirna and Synlogic may not be able to enter into a business combination with another party under certain circumstances because of restrictions in the Merger Agreement, which could adversely affect their respective businesses;
- certain provisions of the Merger Agreement may discourage third parties from submitting alternative takeover proposals, including proposals that may be superior to the arrangements contemplated by the Merger Agreement;
- because the lack of a public market for shares of Synlogic Capital Stock makes it difficult to evaluate the fairness of the Merger, the Synlogic Stockholders may receive consideration in the Merger that is less than the fair market value of the shares of Synlogic Capital Stock and/or Mirna may pay more than the fair market value of the shares of Synlogic Capital Stock; and
- if the conditions to the Merger are not met, the Merger will not occur.

These risks and other risks are discussed in greater detail under the section entitled "*Risk Factors*" in this proxy statement/prospectus/information statement. Mirna and Synlogic both encourage you to read and consider all of these risks carefully.

Regulatory Approvals (see page 135)

In the United States, Mirna must comply with applicable federal and state securities laws and the rules and regulations of the NASDAQ Stock Market LLC ("NASDAQ") in connection with the issuance of shares of Mirna Common Stock and the filing of this proxy statement/prospectus/information statement with the SEC.

NASDAQ Global Market Listing (see page 138)

Prior to consummation of the Merger, Mirna intends to file an initial listing application with the NASDAQ Global Market pursuant to NASDAQ's "reverse merger" rules. If such application is accepted, Mirna anticipates that shares of Mirna Common Stock will be listed on the NASDAQ Global Market following the Closing under the trading symbol "SYBX."

Anticipated Accounting Treatment (see page 138)

The Merger is expected to be treated by Mirna as a reverse merger and accounted for as an asset acquisition in accordance with U.S. generally accepted accounting principles ("U.S. GAAP"). For accounting purposes, Synlogic is considered to be acquiring Mirna in the Merger.

Appraisal Rights and Dissenters' Rights (see page 138)

Holders of shares of Mirna Common Stock are not entitled to appraisal rights in connection with the Merger. Synlogic Stockholders are entitled to appraisal rights in connection with the Merger under Delaware law. For more information about such rights, see the provisions of Section 262 of the General Corporation Law of the State of Delaware (the "DGCL") attached hereto as *Annex C*, and the section entitled "*The Merger—Appraisal Rights and Dissenters' Rights*" in this proxy statement/prospectus/information statement.

Comparison of Stockholder Rights (see page 310)

Both Mirna and Synlogic are incorporated under the laws of the State of Delaware and, accordingly, the rights of the stockholders of each are currently, and will continue to be, governed by the DGCL. If the Merger is completed, Synlogic Stockholders will become Mirna Stockholders, and their rights will be governed by the DGCL, the bylaws of Mirna and, assuming Proposals No. 2 and 3 are approved by Mirna Stockholders at the Annual Meeting, the amended and restated certificate of incorporation of Mirna. The rights of Mirna Stockholders contained in the amended and restated certificate of incorporation and bylaws of Mirna differ from the rights of Synlogic Stockholders under the amended and restated certificate of incorporation and bylaws of Synlogic, as more fully described under the section entitled "*Comparison of Rights of Holders of Mirna Stock and Synlogic Stock*" in this proxy statement/prospectus/information statement.

SELECTED HISTORICAL AND UNAUDITED PRO FORMA CONDENSED COMBINED FINANCIAL DATA

The following tables present summary historical financial data for Mirna and Synlogic, summary unaudited pro forma condensed combined financial data for Mirna and Synlogic, and comparative historical and unaudited pro forma per share data for Mirna and Synlogic.

Selected Historical Financial Data of Mirna

The selected statement of operations data for the years ended December 31, 2016, 2015 and 2014 and the selected balance sheet data as of December 31, 2016 and 2015 are derived from Mirna's audited financial statements prepared using accounting principles generally accepted in the United States ("U.S. GAAP"), which are included in this proxy statement/prospectus/information statement. The selected statement of operations data for the years ended December 31, 2013 and 2012 and the selected balance sheet data as of December 31, 2014, 2013 and 2012 are derived from Mirna's audited financial statements, which are not included in this proxy statement/prospectus/information statement. The selected financial data for the three months ended March 31, 2017 and 2016, are derived from Mirna's unaudited condensed financial statements included in this proxy statement/prospectus/information statement. The financial data should be read in conjunction with *"Mirna Management's Discussion and Analysis of Financial Condition and Results of Operations"* and Mirna's condensed financial statements and related notes appearing elsewhere in this proxy statement/prospectus/information statement. The historical results are not necessarily indicative of results to be expected in any future period.

	Years Ended December 31,					Three Months Ended March 31,	
	2016	2015	2014	2013	2012	2017	2016
						(unaudited)	
	(in thousands, except share and per share data)						
Statement of Operations Data:							
Operating expenses:							
Research and development	$ 13,930	$ 18,947	$ 10,545	$ 4,391	$ 2,742	$ 242	$ 4,523
General and administrative	8,118	6,080	3,369	2,384	1,562	2,264	2,130
Restructuring expense	4,442	—	—	—	—	2,557	—
Loss on disposal of assets	128	—	—	—	—	—	—
Write-off of offering expenses	—	—	1,920	—	—	—	—
Total operating expenses	26,618	25,027	15,834	6,775	4,304	5,063	6,653
Other income (expense):							
Interest income (expense)	350	44	—	—	(355)	86	82
Gain on extinguishment of note payable	—	—	—	—	1,001	—	—
Change in fair value of option liability	—	—	—	339	—	—	—
Net loss	$ (26,268)	$ (24,983)	$(15,834)	$ (6,436)	$ (3,658)	$ (4,977)	$ (6,571)
Less: Accretion and dividends on convertible preferred stock	—	(4,320)	(2,824)	(2,324)	(6,142)	—	—
Net loss attributable to common stockholders	$ (26,268)	$ (29,303)	$(18,658)	$ (8,760)	$ (9,800)	$ (4,977)	$ (6,571)
Net loss per share attributable to common stockholders, basic and diluted	$ (1.26)	$ (5.85)	$(291.00)	$(4,408.65)	$(5,603.23)	$ (0.24)	$ (0.32)
Common shares used to compute basic and diluted net loss per share attributable to common stockholders	20,833,963	5,010,323	64,131	1,987	1,749	20,850,494	20,830,555

	At December 31,					At March 31,
	2016	2015	2014	2013	2012	2017
						(unaudited)
	(in thousands)					
Balance Sheet Data:						
Cash and cash equivalents	$ 16,432	$ 89,713	$ 9,319	$ 23,182	$ 13,266	$ 17,121
Short-term marketable securities	44,066	—	—	—	—	40,408
Total assets	64,166	90,917	9,825	23,684	13,706	60,608
Total liabilities	3,814	5,901	2,499	1,145	4,364	4,857
Convertible preferred stock	—	—	55,277	52,453	33,710	—
Common stock	21	21	—	—	—	21
Additional paid-in capital	163,126	161,518	—	890	—	163,518
Accumulated deficit	(102,791)	(76,523)	(47,951)	(30,804)	(24,368)	(107,771)
Other comprehensive income	(4)	—	—	—	—	(17)
Total stockholders' equity (deficit)	60,352	85,016	(47,951)	(29,914)	(24,368)	55,571

Selected Historical Financial Data of Synlogic

The selected financial data as of December 31, 2016 and 2015 and for the years ended December 31, 2016 and 2015 are derived from Synlogic's audited consolidated financial statements prepared using U.S. GAAP, which are included in this proxy statement/prospectus/information statement. The statement of operations data for the three months ended March 31, 2017 and 2016, as well as the balance sheet data as of March 31, 2017, are derived from Synlogic's unaudited consolidated financial statements included in this proxy statement/prospectus/information statement. In the opinion of management of Synlogic, the unaudited financial statements reflect all adjustments, which include normal recurring adjustments, necessary to state fairly Synlogic's results of operations and financial position. These historical results are not necessarily indicative of results to be expected in any future period. The selected financial data should be read in conjunction with *"Synlogic Management's Discussion and Analysis of Financial Condition and Results of Operations"* and Synlogic's financial statements and the related notes to those statements appearing elsewhere in this proxy statement/prospectus/information statement.

	Years Ended December 31,		Three Months Ended March 31,	
	2016	2015	2017	2016
			(unaudited)	
	(in thousands, except per unit data)			
Statements of Operations Data:				
Revenue	$ 444	$ —	$ 111	$ 111
Operating expenses				
Research and development	15,010	4,024	5,118	2,324
General and administrative	6,398	4,500	2,367	1,613
Total operating expenses	21,408	8,524	7,485	3,937
Loss from operations	(20,964)	(8,524)	(7,374)	(3,826)
Interest income (expense), net	10	(8)	6	(2)
Net loss	$ (20,954)	$ (8,532)	$ (7,368)	$ (3,828)
Net loss per unit attributable to common unit holders—basic and diluted	$ (7.36)	$ (3.13)	$ (2.49)	$ (1.39)
Weighted-average common units used in computing net loss per unit attributable to common unit holders—basic and diluted	2,848,081	2,723,630	2,965,234	2,746,875

	As of December 31, 2016	As of December 31, 2015	As of March 31, 2017 (unaudited)
	(in thousands)		
Selected Balance Sheet Data:			
Cash	$ 14,586	$ 6,179	$ 34,146
Deferred revenue	1,556	2,000	1,445
Working capital, net	11,877	3,891	31,203
Total assets	20,039	7,367	39,136
Total liabilities	6,536	4,007	2,122
Contingently redeemable preferred units	5,000	2,383	5,000
Preferred units	39,159	11,048	65,808
Common units	592	223	722
Accumulated deficit	(31,248)	(10,294)	(38,616)
Total equity	8,503	977	27,914

Selected Unaudited Pro Forma Condensed Combined Financial Data of Mirna and Synlogic

The following information does not give effect to the Reverse Stock Split of Mirna Common Stock.

The following selected unaudited pro forma condensed combined financial data was prepared using the acquisition method of accounting under U.S. GAAP. For accounting purposes, Synlogic is considered to be acquiring Mirna in the Merger. The Mirna and Synlogic unaudited pro forma combined balance sheet data assume that the Merger took place on March 31, 2017, and combines the Mirna and Synlogic historical balance sheets at March 31, 2017. The Mirna and Synlogic unaudited pro forma condensed combined statements of operations data assume that the Merger took place as of January 1, 2016, and combines the historical results of Mirna and Synlogic for the three months ended March 31, 2017 and the year ended December 31, 2016. In addition, the pro forma condensed combined financial data also gives effect to Synlogic's issuance and sale of 5,210,922 shares of Series C convertible preferred stock for total consideration of approximately $40.4 million, net of issuance costs of approximately $1.6 million (the "Issuance of Series C").

The selected unaudited pro forma condensed combined financial data are presented for illustrative purposes only and are not necessarily indicative of the combined financial position or results of operations of future periods or the results that actually would have been realized had the entities been a single entity during these periods. The selected unaudited pro forma condensed combined financial data as of and for the three months ended March 31, 2017 and for the year ended December 31, 2016 are derived from the unaudited pro forma condensed combined financial information and should be read in conjunction with that information. For more information, please see the section entitled *"Unaudited Pro Forma Condensed Combined Financial Information"* in this proxy statement/prospectus/information statement.

The unaudited pro forma condensed combined financial information assumes that, at the Effective Time, each share of Synlogic Capital Stock will be converted into the right to receive shares of Mirna Common Stock such that, immediately after the Merger, Mirna Stockholders are expected to own approximately 17% of the fully-diluted common stock of the combined organization and Synlogic Stockholders are expected to own approximately 83% of the fully-diluted common stock of the combined organization, and is subject to adjustment to account for the occurrence of certain events discussed elsewhere in this proxy statement/prospectus/information statement.

Unaudited Pro Forma Condensed Combined Statements of Operations Data

	For the Year Ended December 31, 2016	For the Three Months Ended March 31, 2017
	(in thousands, except per share data)	
Revenue	$ 444	$ 111
Research and development expenses	(27,474)	(5,360)
General and administrative expenses	(15,932)	(3,907)
Restructuring expenses	(4,442)	(2,557)
Loss from operations	(47,532)	(11,713)
Net loss	(47,172)	(11,621)
Net loss per share, basic and diluted	$ (0.52)	$ (0.11)

Unaudited Pro Forma Condensed Combined Balance Sheet Data

	As of March 31, 2017
	(in thousands)
Cash and cash equivalents	$ 91,667
Working capital, net	110,998
Total assets	140,144
Accumulated deficit	(43,590)
Total stockholders' equity	115,168

Comparative Historical and Unaudited Pro Forma Per Share Data

The information below reflects the historical net loss and book value per share of Mirna Common Stock and the historical net loss and book value per unit of Synlogic, LLC common units in comparison with the unaudited pro forma net loss and book value per share after giving effect to the Merger on a purchase basis. The unaudited pro forma net loss and book value per share does not give effect to the proposed Reverse Stock Split.

You should read the tables below in conjunction with the audited and unaudited consolidated financial statements of Mirna included in this proxy statement/prospectus/information statement and the audited and unaudited financial statements of Synlogic included in this proxy statement/prospectus/information statement and the related notes and the unaudited pro forma condensed combined financial information and notes related to such financial statements included elsewhere in this proxy statement/prospectus/information statement.

Mirna

	Year Ended December 31, 2016	Three Months Ended March 31, 2017
Historical Per Common Share Data:		
Basic and diluted net loss per share	$ (1.26)	$ (0.24)
Book value per share	2.90	2.67

Synlogic

	Year Ended December 31, 2016	Three Months Ended March 31, 2017
Historical Per Common Unit Data:		
Basic and diluted net loss per unit	$ (7.36)	$ (2.49)
Book value per unit	4.74	11.10

Mirna and Synlogic

	Year Ended December 31, 2016	Three Months Ended March 31, 2017
Pro Forma Per Common Share Data:		
Basic and diluted net loss per share	$ (0.52)	$ (0.11)
Book value per share	N/A	1.11

MARKET PRICE AND DIVIDEND INFORMATION

The Mirna Common Stock has been listed on the NASDAQ Global Market under the symbol "MIRN" since Mirna's initial public offering ("IPO") of the Mirna Common Stock on October 1, 2015. The following table presents the range of high and low per share sales prices for the Mirna Common Stock as reported on the NASDAQ Global Market for each of the periods set forth below. Synlogic is a private company and the Synlogic Common Stock and Synlogic Preferred Stock are not publicly traded. These per share sales prices do not give effect to the Reverse Stock Split.

Mirna Common Stock

	High	Low
Year Ended December 31, 2017		
First Quarter	$ 2.35	$1.63
Second Quarter (through the Record Date)	$ [●]	$ [●]
Year Ended December 31, 2016		
First Quarter	$ 6.65	$3.57
Second Quarter	$ 4.94	$3.96
Third Quarter	$ 4.45	$1.82
Fourth Quarter	$ 1.98	$1.12
Year Ended December 31, 2015		
Fourth Quarter	$11.01	$5.54

The closing price of the Mirna Common Stock on June 20, 2017, as reported on the NASDAQ Global Market, was $1.53 per share.

Because the market price of the Mirna Common Stock is subject to fluctuation, the market value of the shares of the Mirna Common Stock that Synlogic Stockholders will be entitled to receive in the Merger may increase or decrease.

Assuming approval of Proposal Nos. 1 and 2 and successful application for initial listing with the NASDAQ Global Market, following the consummation of the Merger, the Mirna Common Stock will be listed on the NASDAQ Global Market and will trade under the trading symbol "SYBX."

As of [●], 2017, the Record Date for the Annual Meeting, Mirna had approximately [●] holders of record of the Mirna Common Stock. As of [●], 2017, Synlogic had [●] holders of record of Synlogic Common Stock and [●] holders of record of Synlogic Preferred Stock. For detailed information regarding the beneficial ownership of certain Mirna Stockholders upon consummation of the Merger, see the section entitled "*Principal Stockholders of the Combined Organization*" in this proxy statement/prospectus/information statement.

Dividends

Mirna has never declared or paid any cash dividends on the Mirna Common Stock and does not anticipate paying cash dividends on the Mirna Common Stock for the foreseeable future. Notwithstanding the foregoing, any determination to pay cash dividends subsequent to the Merger will be at the discretion of the combined organization's then-current board of directors and will depend upon a number of factors, including the combined organization's results of operations, financial condition, future prospects, contractual restrictions, restrictions imposed by applicable law and other factors the then-current board of directors deems relevant.

Synlogic has never paid or declared any cash dividends on the Synlogic Capital Stock. If the Merger does not occur, Synlogic does not anticipate paying any cash dividends on the Synlogic Capital Stock in the foreseeable future, and Synlogic intends to retain all available funds and any future earnings to fund the development and expansion of its business. Any future determination to pay dividends will be at the discretion of the Synlogic Board of Directors and will depend upon a number of factors, including its results of operations, financial condition, future prospects, contractual restrictions, restrictions imposed by applicable law and other factors Synlogic's Board of Directors deems relevant.

RISK FACTORS

The combined organization will be faced with a market environment that cannot be predicted and that involves significant risks, many of which will be beyond its control. In addition to the other information contained in this proxy statement/prospectus/information statement, you should carefully consider the material risks described below before deciding how to vote your shares of stock. In addition, you should read and consider the risks associated with the business of Mirna because these risks may also affect the combined organization—these risks can be found in Mirna's Annual Report on Form 10-K, as updated by subsequent Quarterly Reports on Form 10-Q, all of which are filed with the SEC and incorporated by reference into this proxy statement/prospectus/information statement. You should also read and consider the other information in this proxy statement/prospectus/information statement and the other documents incorporated by reference into this proxy statement/prospectus/information statement. Please see the section entitled "Where You Can Find More Information" in this proxy statement/prospectus/information statement.

Risks Related to the Merger

The exchange ratio is not adjustable based on the market price of Mirna Common Stock so the Merger Consideration at the Closing may have a greater or lesser value than the market price at the time the Merger Agreement was signed.

The Merger Agreement has set the Exchange Ratio formula for Synlogic Capital Stock, and the Exchange Ratio is adjustable upward or downward based on Mirna's net cash at the closing of the Merger and changes in the outstanding Synlogic Capital Stock or the outstanding Mirna Common Stock, including in connection with the proposed Reverse Stock Split prior to completion of the Merger as described in the section entitled *"The Merger—Merger Consideration and Adjustment"* in this proxy statement/prospectus/information statement. Any changes in the market price of Mirna Common Stock before the completion of the Merger will not affect the number of shares Synlogic Stockholders will be entitled to receive pursuant to the Merger Agreement. Therefore, if before the completion of the Merger, the market price of Mirna Common Stock declines from the market price on the date of the Merger Agreement, then Synlogic Stockholders could receive Merger Consideration with substantially lower value. Similarly, if before the completion of the Merger, the market price of Mirna Common Stock increases from the market price on the date of the Merger Agreement, then Synlogic Stockholders could receive Merger Consideration with substantially more value for their shares of Synlogic Capital Stock than the parties had negotiated in the establishment of the Exchange Ratio. The Merger Agreement does not include a price-based termination right. Because the Exchange Ratio does not adjust as a result of changes in the value of Mirna Common Stock, for each one percentage point that the market value of Mirna Common Stock rises or declines, there is a corresponding one percentage point rise or decline, respectively, in the value of the total Merger Consideration issued to Synlogic Stockholders.

Mirna's net cash may be less than $40.0 million at the closing of the Merger, which would result in Mirna Stockholders owning a smaller percentage of the combined organization and could even result in the termination of the Merger Agreement.

For purposes of the Merger Agreement, net cash is subject to certain reductions, including, without limitation, accounts payable, accrued expenses (except those related to the Merger), current liabilities payable in cash, unpaid expenses related to the Merger and certain other unpaid obligations, including outstanding lease obligations. In the event the amount of Mirna's cash is smaller or such reductions are greater than anticipated, Mirna Stockholders could hold a significantly smaller portion of the combined organization. Additionally, the Merger Agreement includes a termination right based upon a minimum net cash threshold of $33.5 million. In the event that Mirna's net cash falls below this threshold, then Synlogic will have the right to terminate the Merger Agreement.

Failure to complete the Merger may result in Mirna and Synlogic paying a termination fee or expenses to the other party and could harm the price of Mirna Common Stock and the future business and operations of each company.

If the Merger is not completed, Mirna and Synlogic are subject to the following risks:

- if the Merger Agreement is terminated under certain circumstances, Mirna or Synlogic will be required to pay certain transaction expenses of the other party, up to a maximum of $1.0 million;
- if the Merger Agreement is terminated under certain circumstances, Mirna or Synlogic will be required to pay the other party a termination fee of $2.0 million, plus certain transaction expenses of the other party;
- the price of Mirna Common Stock may decline and remain volatile; and
- costs related to the Merger, such as legal and accounting fees which Mirna and Synlogic estimate will total approximately $6.8 million and $2.3 million, respectively, some of which must be paid even if the Merger is not completed.

In addition, if the Merger Agreement is terminated and the Mirna Board of Directors or the Synlogic Board of Directors determines to seek another business combination, there can be no assurance that either Mirna or Synlogic will be able to find a partner willing to provide equivalent or more attractive consideration than the consideration to be provided by each party in the Merger.

The Merger may be completed even though material adverse changes may result from the announcement of the Merger, industry-wide changes and other causes.

In general, either Mirna or Synlogic can refuse to complete the Merger if there is a material adverse change affecting the other party between the date of the Merger Agreement, and the Closing. However, certain types of changes do not permit either party to refuse to complete the Merger, even if such change could be said to have a material adverse effect on Mirna or Synlogic, including:

- any rejection or non-acceptance by a governmental body of a registration or filing by Mirna or Synlogic relating to certain intellectual property rights of Mirna or Synlogic;
- the taking of any action, or the failure to take any action, by either Mirna or Synlogic required to comply with the terms of the Merger Agreement;
- any effect resulting from the announcement or pendency of the Merger or any related transactions;
- any natural disaster or any act or threat of terrorism or war anywhere in the world, any armed hostilities or terrorist activities anywhere in the world, any threat or escalation or armed hostilities or terrorist activities anywhere in the world or any governmental or other response or reaction to any of the foregoing;
- any change in accounting requirements or principles of any change in applicable laws, rules or regulations or the interpretation thereof;
- any general economic or political conditions or conditions generally affecting the industries in which the Mirna and Synlogic operate;
- with respect to Mirna, any change in the stock price or trading volume of Mirna Common Stock excluding any underlying effect that may have caused such change; and
- with respect to Synlogic, any change in the cash position of Synlogic that results from operations in the ordinary course of business.

If adverse changes occur and Mirna and Synlogic still complete the Merger, the price of Mirna Common Stock may suffer. This in turn may reduce the value of the Merger to the Mirna Stockholders, the Synlogic Stockholders or both.

Some Mirna and Synlogic officers and directors have interests in the Merger that are different from yours and that may influence them to support or approve the Merger without regard to your interests.

Certain officers and directors of Mirna and Synlogic participate in arrangements that provide them with interests in the Merger that are different from yours, including, among others, the continued service as an officer or director of the combined organization, severance benefits, the acceleration of stock option vesting, continued indemnification and the potential ability to sell an increased number of shares of common stock of the combined organization in accordance with Rule 144 under the Securities Act of 1933, as amended (the "Securities Act"). For example, Mirna has entered into certain employment and severance benefits agreements with each of its executive officers that may result in the receipt by such executive officers of cash severance payments and other benefits with a total value of approximately $1.9 (collectively, not individually, and excluding the value of any accelerated vesting of stock awards) and the acceleration of stock awards held by those officers, including options to purchase shares of Mirna Common Stock, based on data available as of May 31, 2017 and assuming a covered termination of employment of each executive officer's employment as of such date. The Closing of the Merger will also result in the acceleration of vesting of a portion of the stock awards, including options to purchase shares of Mirna Common Stock held by the Mirna executive officers and directors, whether or not there is a covered termination of such officer's employment. For more information concerning the treatment of Mirna options in connection with the Merger, see the section entitled *"The Merger Agreement—Treatment of Mirna Stock Options"* in this proxy statement/prospectus/information statement. In addition, and for example, certain of Synlogic's directors and executive officers have options, subject to vesting, to purchase shares of Synlogic Common Stock which, at the Closing, shall be converted into and become options to purchase shares of Mirna Common Stock; certain of Synlogic's directors and executive officers are expected to become directors and executive officers of Mirna upon the Closing; and all of Synlogic's directors and executive officers are entitled to certain indemnification and liability insurance coverage pursuant to the terms of the Merger Agreement. For more information concerning the interests of Mirna and Synlogic executive officers and directors, see the sections entitled *"The Merger—Interests of Mirna Directors and Executive Officers in the Merger"* and *"The Merger—Interests of Synlogic Directors and Executive Officers in the Merger"* in this proxy statement/prospectus/information statement.

The market price of Mirna Common Stock following the Merger may decline as a result of the Merger.

The market price of Mirna Common Stock may decline as a result of the Merger for a number of reasons if:

- investors react negatively to the prospects of the combined organization's business and prospects from the Merger;
- the effect of the Merger on the combined organization's business and prospects is not consistent with the expectations of financial or industry analysts; or
- the combined organization does not achieve the perceived benefits of the Merger as rapidly or to the extent anticipated by financial or industry analysts.

Mirna Stockholders may not realize a benefit from the Merger commensurate with the ownership dilution they will experience in connection with the Merger.

If the combined organization is unable to realize the full strategic and financial benefits currently anticipated from the Merger, Mirna Stockholders will have experienced substantial dilution of their ownership interests without receiving any commensurate benefit, or only receiving part of the commensurate benefit to the extent the combined organization is able to realize only part of the strategic and financial benefits currently anticipated from the Merger.

Mirna Stockholders and Synlogic Stockholders will have a reduced ownership and voting interest in, and will exercise less influence over the management of, the combined organization following the completion of the Merger as compared to their current ownership and voting interests in the respective companies.

After the completion of the Merger, the current Mirna Stockholders and Synlogic Stockholders will own a smaller percentage of the combined organization than their ownership of their respective companies prior to the Merger. Immediately after the Merger, Mirna Stockholders, whose shares of Mirna Common Stock will remain outstanding after the Merger, will own approximately 17% of the fully-diluted Mirna Common Stock and Synlogic Stockholders will own approximately 83% of the fully-diluted Mirna Common Stock, in each case, excluding out-of-the-money securities. These estimates are based on the anticipated Exchange Ratio and are subject to adjustment.

During the pendency of the Merger, Mirna and Synlogic may not be able to enter into a business combination with another party at a favorable price because of restrictions in the Merger Agreement, which could adversely affect their respective businesses.

Covenants in the Merger Agreement impede the ability of Mirna and Synlogic to make acquisitions, subject to certain exceptions relating to fiduciary duties, as set forth below, or to complete other transactions that are not in the ordinary course of business pending completion of the Merger. As a result, if the Merger is not completed, the parties may be at a disadvantage to their competitors during such period. In addition, while the Merger Agreement is in effect, each party is generally prohibited from soliciting, initiating, encouraging or entering into certain extraordinary transactions, such as merger, sale of assets or other business combination outside the ordinary course of business with any third party, subject to certain exceptions relating to fiduciary duties, as set forth below. Any such transactions could be favorable to such party's stockholders.

Certain provisions of the Merger Agreement may discourage third parties from submitting alternative takeover proposals, including proposals that may be superior to the arrangements contemplated by the Merger Agreement.

The terms of the Merger Agreement prohibit each of Mirna and Synlogic from soliciting alternative takeover proposals or cooperating with persons making unsolicited takeover proposals, except in limited circumstances when such party's board of directors determines in good faith that an unsolicited alternative takeover proposal is or is reasonably likely to be inconsistent with the board's fiduciary duties. Moreover, even if a party receives what the party's board of directors determine is a superior proposal, the Merger Agreement does not permit either party to terminate the Merger Agreement to enter into a superior proposal.

Because the lack of a public market for Synlogic Capital Stock makes it difficult to evaluate the value of Synlogic of Capital Stock, the Synlogic Stockholders may receive shares of Mirna Common Stock in the Merger that have a value that is less than, or greater than, the fair market value of Synlogic Capital Stock.

The outstanding Synlogic Capital Stock is privately held and is not traded in any public market. The lack of a public market makes it extremely difficult to determine the fair market value of Synlogic Capital Stock. Because the percentage of Mirna equity to be issued to Synlogic Stockholders was determined based on negotiations between the parties, it is possible that the value of the Mirna Common Stock to be received by Synlogic Stockholders will be less than the fair market value of Synlogic Capital Stock, or Mirna may pay more than the aggregate fair market value of Synlogic Capital Stock.

If the conditions of the Merger are not met, the Merger will not occur.

Even if the Merger is approved by Mirna Stockholders and Synlogic Stockholders, specified conditions must be satisfied or waived to complete the Merger. These conditions are set forth in the Merger Agreement and described in the section entitled "*The Merger Agreement—Conditions to the Completion of the Merger*" in this

proxy statement/prospectus/information statement. Mirna and Synlogic cannot assure you that all of the conditions will be satisfied or waived. If the conditions are not satisfied or waived, the Merger will not occur or will be delayed, and Mirna and Synlogic each may lose some or all of the intended benefits of the Merger.

The Merger may fail to qualify as a reorganization for U.S. federal income tax purposes, resulting in recognition of taxable gain or loss by Synlogic Stockholders in respect of their Synlogic Capital Stock.

Mirna and Synlogic intend for the Merger to qualify as a reorganization within the meaning of Section 368(a) of the Code, as described in the section entitled "*The Merger—Material U.S. Federal Income Tax Consequences of the Merger*" in this proxy statement/prospectus/information statement. In the event that the Merger does not qualify as a reorganization, the Merger would result in taxable gain or loss for each Synlogic Stockholder, with the amount of such gain or loss determined by the amount that each Synlogic Stockholder's adjusted tax basis in the Synlogic Capital Stock surrendered is less or more than the fair market value of the Mirna Common Stock and any cash in lieu of a fractional share received in exchange therefor. Each holder of Synlogic Capital Stock is urged to consult with his, her or its own tax advisor with respect to the tax consequences of the Merger.

Risks Related to Mirna

Mirna's business has been almost entirely dependent on the success of MRX34, and Mirna has decided to discontinue further development of MRX34 and Mirna's microRNA product pipeline and devote significant time and resources to pursing the Merger, which may not be successful.

To date, Mirna has invested substantially all of its efforts and financial resources in the research and development of MRX34, which was its only product candidate to enter in clinical trials. On September 20, 2016, Mirna voluntarily halted the Phase 1 trial following multiple immune-related SAEs and the IND for MRX34 was placed on full clinical hold. In November 2016, Mirna discontinued research and development activities to reduce operating expenses while the company evaluated strategic alternatives with a goal to enhance stockholder value. Following its suspension of the Phase 1 trial for MRX34 and the FDA's clinical hold on the IND for MRX34, Mirna discontinued development of MRX34 and the microRNA product pipeline and closed the IND.

There can be no assurance that the Merger will be completed in a timely manner or at all. In addition, even if the Merger is completed, there can be no assurance that the Merger will enhance stockholder value. The Merger Agreement is subject to many closing conditions and termination rights, as set forth in more detail in *"The Merger Agreement—Conditions to the Completion of the Merger"* and *"The Merger Agreement—Termination"* in this proxy statement/prospectus/information statement. In addition to Mirna's intellectual property related to its research and development efforts (for which Mirna has discontinued development), Mirna's assets currently consist primarily of cash, cash equivalents and marketable securities, its listing on the NASDAQ Global Market and the Merger Agreement.

If Mirna does not close the Merger, the Mirna Board of Directors may elect to attempt to complete another strategic transaction similar to the Merger. Attempting to complete another strategic transaction similar to the Merger would be costly and time consuming, and Mirna cannot make any assurances that a future strategic transaction will occur on commercially reasonable terms or at all. There also can be no assurance that Mirna will conduct further drug research or development activities in the future.

If Mirna does not successfully consummate the Merger or another strategic transaction, the Mirna Board of Directors may decide to pursue a dissolution and liquidation of the company. In such an event, the amount of cash available for distribution to Mirna Stockholders will depend heavily on the timing of such liquidation as well as the amount of cash that will need to be reserved for commitments and contingent liabilities.

There can be no assurance that the Merger will be completed. If the Merger is not completed, the Mirna Board of Directors may decide to pursue a dissolution and liquidation of the company. In such an event, the

amount of cash available for distribution to Mirna Stockholders will depend heavily on the timing of such decision and, ultimately, such liquidation, since the amount of cash available for distribution continues to decrease as Mirna funds its operations while pursuing the Merger. In addition, if the Mirna Board of Directors were to approve and recommend, and Mirna Stockholders were to approve, a dissolution and liquidation of the company, Mirna would be required under Delaware corporate law to pay its outstanding obligations, as well as to make reasonable provision for contingent and unknown obligations, prior to making any distributions in liquidation to Mirna Stockholders. Mirna's commitments and contingent liabilities may include (i) obligations under its employment and related agreements with certain employees that provide for severance and other payments following a termination of employment occurring for various reasons, including a change in control of the company; (ii) potential litigation against Mirna, and other various claims and legal actions arising in the ordinary course of business; and (iii) non-cancelable facility lease obligations. As a result of this requirement, a portion of Mirna's assets may need to be reserved pending the resolution of such obligations. In addition, Mirna may be subject to litigation or other claims related to a dissolution and liquidation of the company. If a dissolution and liquidation were pursued, the Mirna Board of Directors, in consultation with its advisors, would need to evaluate these matters and make a determination about a reasonable amount to reserve. Accordingly, holders of Mirna Common Stock could lose all or a significant portion of their investment in the event of a liquidation, dissolution or winding up of the company.

Mirna is substantially dependent on its remaining employees to facilitate the consummation of the Merger.

Mirna's ability to successfully complete the Merger, or if the Merger is not completed, another potential strategic transaction, depends in large part on its ability to retain certain of its remaining personnel, particularly Paul Lammers, M.D., M.Sc., Mirna's president and chief executive officer. Despite Mirna's efforts to retain these employees, one or more may terminate their employment with the company on short notice. The loss of the services of any of these employees could potentially harm Mirna's ability to evaluate and pursue strategic alternatives, as well as fulfill its reporting obligations as a public company.

Mirna has incurred significant losses since inception. The company anticipates that it will continue to incur significant losses for the foreseeable future, and if the company is unable to achieve and sustain profitability, the market value of the Mirna Common Stock will likely decline.

Mirna is a biopharmaceutical company with a limited operating history. Biopharmaceutical product development is a highly speculative undertaking and involves a substantial degree of risk. Mirna has not generated any product revenues and it does not expect to generate any product revenues for the foreseeable future. Mirna has incurred losses in each year since the company's founding in 2007 and it expects to continue to incur significant operating losses for the foreseeable future. The amount of future losses is uncertain. None of Mirna's product candidates has been approved for sale. Mirna has historically devoted substantially all of its efforts to research and development, including its preclinical and nonclinical development activities. In November 2016, Mirna discontinued research and development activities to reduce operating expenses while the company evaluates strategic alternatives with a goal to enhance stockholder value, including the Merger or, if the Merger is not completed, another merger or sale of the company. To date, Mirna has derived all of its funding from the company's collaboration with its former parent company, Asuragen, Inc. ("Asuragen") private and public placements of Mirna's capital stock and government grants for research and development. Mirna's net loss for the three months ended March 31, 2017 was $5.0 million. Since inception, the company has incurred net losses leading to an accumulated deficit of approximately $107.8 million as of March 31, 2017.

Mirna expects to continue to incur significant expenses and operating losses for the foreseeable future as it evaluates and pursues strategic alternatives with a goal to enhance stockholder value, including the Merger, or, if the Merger is not completed, another merger or sale of the company. Mirna's prior losses, combined with expected future losses, have had and will continue to have an adverse effect on Mirna Stockholders' equity and the company's working capital. If Mirna is unable to achieve and sustain profitability, the market value of the Mirna Common Stock will likely decline. Because of the numerous risks and uncertainties associated with

developing biopharmaceutical products, Mirna is unable to predict the extent of any future losses or whether the company will become profitable.

Mirna's short operating history may make it difficult to evaluate the success of the company's business to date and to assess its future viability.

Mirna is a biopharmaceutical company that was founded in 2007 and did not exist as a standalone company until 2009. Mirna's operations to date have historically been limited to organizing and staffing the company, business planning, raising capital, acquiring and developing its technology, identifying and evaluating potential product candidates and delivery technologies, undertaking nonclinical studies, filing an IND application with the FDA, and conducting a Phase 1 clinical trial. None of Mirna's product candidates are in clinical development and, in November 2016, Mirna discontinued its research and development activities relating to the company's product candidates that were in development. Mirna has not demonstrated its ability to initiate clinical trials for product candidates other than MRX34, or successfully complete any clinical trials, including large-scale, pivotal clinical trials, obtain marketing approvals, manufacture a commercial scale medicine, or arrange for a third party to do so on Mirna's behalf, or conduct sales and marketing activities necessary for successful commercialization. Typically, it takes many years to develop one new product candidate from the time it is discovered to when it is available for treating patients. Consequently, any predictions about Mirna's future success or viability, or any evaluation of the company's business or prospects, may not be as accurate as they could be if the company had a longer operating history. In addition, as a new business, Mirna may encounter unforeseen expenses, difficulties, complications, delays and other known and unknown challenges.

Recent changes in Mirna's executive leadership and any similar changes in the future may serve as a significant distraction for Mirna's management and employees.

Since the beginning of 2016, there have been several changes to Mirna's executive leadership team. In May 2016, Mirna transitioned the company's Chief Medical Officer from Dr. Sinil Kim to Dr. Vincent O'Neill and, in June 2016, Mirna mutually agreed with Dr. Miguel Barbosa that Dr. Barbosa would resign as the company's Chief Scientific Officer. Effective in December 2016, Mirna terminated the employment of Jon Irvin, the company's Vice President of Finance, in connection with Mirna's restructuring as part of a plan to reduce operating costs. In May 2017, Mirna and Dr. O'Neill mutually agreed that Dr. O'Neill would resign as the company's Chief Medical Officer. Such changes, or any other future changes in Mirna's executive leadership, may disrupt the company's operations as it adjusts to the reallocation of responsibilities and assimilates new leadership and, potentially, differing perspectives on the company's strategic direction. If the transition in executive leadership is not smooth, the resulting disruption could negatively affect Mirna's ability to execute the company's strategic plan.

Mirna's internal computer systems, or those of its CROs or other contractors or consultants, may fail or suffer security breaches.

Despite the implementation of security measures, Mirna's internal computer systems and those of its contract research organizations ("CROs"), if any, and other contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. While Mirna has not experienced any such system failure, accident or security breach to date, if such an event were to occur and cause interruptions in Mirna's operations, it could result in a material disruption of the company's programs. For example, the loss of clinical trial data from clinical trials for any of Mirna's product candidates could result in delays in any regulatory approval efforts and significantly increase the company's costs to recover or reproduce the data. To the extent that any disruption or security breach results in a loss of or damage to Mirna's data or applications, or inappropriate disclosure of confidential or proprietary information, including the confidential medical information of clinical trial participants, Mirna could incur liability.

Mirna's employees, independent contractors, principal investigators, CROs, consultants and vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

Mirna is exposed to the risk that its employees, independent contractors, principal investigators, CROs, consultants and vendors, if any, may engage in fraudulent or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or disclosure of unauthorized activities to Mirna that violates: (i) FDA regulations, including those laws requiring the reporting of true, complete and accurate information to the FDA; (ii) manufacturing standards; (iii) federal and state healthcare fraud and abuse laws and regulations; or (iv) laws that require the true, complete and accurate information or data. Specifically, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Activities subject to these laws also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to Mirna's reputation. It is not always possible to identify and deter misconduct by Mirna's employees and other third parties, and the precautions the company takes to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting Mirna from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. If any such actions are instituted against Mirna, and the company is not successful in defending itself or asserting its rights, those actions could have a significant impact on Mirna's business, including the imposition of civil, criminal and administrative penalties, damages, monetary fines, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished profits and future earnings, and curtailment of Mirna's operations, any of which could adversely affect Mirna's ability to operate its business and its results of operations.

Requirements associated with being a public company have increased and will continue to increase Mirna's costs significantly, as well as divert significant company resources and management attention.

Prior to Mirna's IPO in 2015, the company was not subject to the reporting requirements of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), or the other rules and regulations of the SEC, or any securities exchange relating to public companies. Mirna is working with its legal, independent accounting and financial advisors to identify those areas in which changes should be made to the company's financial and management control systems to manage the company's growth and its obligations as a public company. These areas include corporate governance, corporate control, disclosure controls and procedures and financial reporting and accounting systems. Mirna has made, and will continue to make, changes in these and other areas. However, the expenses associated with operating as a public company are material, particularly after Mirna ceases to be an "emerging growth company." Compliance with the various reporting and other requirements applicable to public companies also requires considerable time and attention of management. In addition, the changes Mirna has made, and continues to make, may not be sufficient to allow Mirna to satisfy its obligations as a public company on a timely basis, or at all.

However, for as long as Mirna remains an "emerging growth company" as defined in the Jumpstart Our Business Startups Act (the "JOBS Act"), Mirna may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not "emerging growth companies," including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002 (the "Sarbanes-Oxley Act"), reduced disclosure obligations regarding executive compensation in Mirna's periodic reports and proxy statements and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. Alternatively, Mirna may elect to comply with disclosure requirements as if it were not an "emerging growth company," in which case the company would incur the greater expenses associated with such disclosure requirements.

Mirna will remain an "emerging growth company" for up to five years after the completion of its IPO, although if the market value of Mirna Common Stock that is held by non-affiliates exceeds $700 million as of any June 30 before that time or if the company has total annual gross revenues of $1.07 billion or more during any fiscal year before that time, Mirna would cease to be an "emerging growth company" as of the end of that fiscal year. Further, if the company issues more than $1.07 billion in non-convertible debt in a three-year period, Mirna would cease to be an "emerging growth company" immediately.

In addition, being a public company could make it more difficult or costly for Mirna to obtain certain types of insurance, including directors' and officers' liability insurance, and Mirna may be forced to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. The impact of these events could also make it more difficult for Mirna to attract and retain qualified persons to serve on the Mirna Board of Directors, its board committees or as executive officers.

If Mirna is not able to implement the requirements of Section 404 of the Sarbanes-Oxley Act in a timely manner or with adequate compliance, Mirna may be subject to sanctions by regulatory authorities.

Section 404 of the Sarbanes-Oxley Act requires that Mirna evaluate and determine the effectiveness of its internal controls over financial reporting and, beginning with its annual report for fiscal year 2016, provide a management report on the internal control over financial reporting. If Mirna has a material weakness in its internal control over financial reporting, Mirna may not detect errors on a timely basis and its financial statements may be materially misstated. Mirna will be evaluating its internal controls systems to allow management to report on, and eventually allow its independent auditors to attest to, the company's internal controls. Mirna will be performing the system and process evaluation and testing (and any necessary remediation) required to comply with the management certification and eventual auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act. The aforementioned auditor attestation requirements will not apply to Mirna until the company is no longer considered an "emerging growth company."

Mirna cannot be certain as to the timing of completion of the company's evaluation, testing and remediation actions or the impact of the same on the company's operations. If Mirna is not able to implement the requirements of Section 404 in a timely manner or with adequate compliance, Mirna may be subject to sanctions or investigation by regulatory authorities, such as the SEC or NASDAQ. Any such action could adversely affect the company's financial results or investors' confidence in Mirna and could cause the company's stock price to fall. Moreover, if Mirna is not able to comply with the requirements of Section 404 in a timely manner, or if Mirna or its independent registered public accounting firm identifies deficiencies in its internal controls that are deemed to be material weaknesses, the company could be subject to sanctions or investigations by the SEC, NASDAQ or other regulatory authorities, which would entail expenditure of additional financial and management resources and could materially adversely affect Mirna's stock price. Deficient internal controls could also cause Mirna to fail to meet its reporting obligations or cause investors to lose confidence in its reported financial information, which could have a negative effect on Mirna's stock price.

Mirna's ability to utilize its net operating loss carryforwards and certain other tax attributes may be limited.

Mirna has incurred substantial losses during its history and may never achieve profitability. To the extent that Mirna continues to generate taxable losses, unused losses will carry forward to offset future taxable income, if any, until such unused losses expire. Mirna may be unable to use these losses to offset income before such unused losses expire. Under Sections 382 and 383 of the Code, if a corporation undergoes an "ownership change," generally defined as a greater than 50 percentage point change (by value) in its equity ownership over a rolling three-year period, the corporation's ability to use its pre-change net operating loss ("NOL") carryforwards and other pre-change tax attributes to offset its post-change taxable income or tax liabilities may be limited. Mirna believes that it has experienced at least one ownership change in the past. Mirna may also experience additional ownership changes as a result of subsequent shifts in its stock ownership, including as a result of the Closing of the Merger. Accordingly, Mirna's ability to use its pre-change NOL carryforwards to offset U.S. federal taxable income may be subject to limitations, which could potentially result in increased future tax liability to Mirna.

Mirna, or the third parties upon whom Mirna depends, may be adversely affected by natural disasters and Mirna's business continuity and disaster recovery plans may not adequately protect it from a serious disaster.

Natural disasters could severely disrupt Mirna's operations, and have a material adverse effect on the company's business, financial condition and results of operations. If a natural disaster, power outage or other event occurred that prevented Mirna from using all or a significant portion of its headquarters, that damaged critical infrastructure, such as the company's enterprise financial systems or manufacturing resource planning and enterprise quality systems, or that otherwise disrupted operations, it may be difficult or, in certain cases, impossible for Mirna to continue its business for a substantial period of time. The disaster recovery and business continuity plans Mirna has in place currently are limited and are unlikely to prove adequate in the event of a serious disaster or similar event. Mirna may incur substantial expenses as a result of the limited nature of its disaster recovery and business continuity plans, which could have a material adverse effect on the company's business.

Furthermore, if Mirna resumes its research and development activities and integral parties in its supply chain are geographically concentrated and operating from single sites, this would increasing their vulnerability to natural disasters or other sudden, unforeseen and severe adverse events. If such an event were to affect such parties in Mirna's supply chain, it could have a material adverse effect on Mirna's business.

Risks Related to Mirna's Product Development and Commercialization

Mirna faces potential product liability, and, if successful claims are brought against the company, Mirna may incur substantial liability and costs. If the use or misuse of Mirna's product candidates harms patients, or is perceived to harm patients even when such harm is unrelated to Mirna's product candidates, the company could be subject to costly and damaging product liability claims. If Mirna is unable to obtain adequate insurance or is required to pay for liabilities resulting from a claim excluded from, or beyond the limits of, the company's insurance coverage, a material liability claim could adversely affect Mirna's financial condition.

The use or misuse of Mirna's product candidates in clinical trials exposes the company to the risk of product liability claims. Product liability claims might be brought against Mirna by consumers, healthcare providers, pharmaceutical companies or others selling or otherwise coming into contact with Mirna's products. There is a risk that Mirna's product candidates may induce adverse events. If Mirna cannot successfully defend against product liability claims, the company could incur substantial liability and costs. Certain oligonucleotide therapeutics and liposomal drug delivery products have shown injection site reactions, infusion reactions, and pro-inflammatory effects, and may also lead to organ dysfunction, including impairment of kidney or liver function. There is a risk that Mirna's product candidates may induce similar adverse events. Patients with the diseases targeted by Mirna's product candidates are often already in severe and advanced stages of disease and have both known and unknown significant pre-existing and potentially life-threatening health risks. During the course of treatment, patients may suffer adverse events, including death, for reasons that may be related to Mirna's product candidates. Such events could subject Mirna to costly litigation, require the company to pay substantial amounts of money to injured patients, delay, negatively impact or end Mirna's opportunity to receive or maintain regulatory approval to market its products, or require the company to suspend or abandon its commercialization efforts. Even in a circumstance in which Mirna does not believe that an adverse event is related to its products, the investigation into the circumstance may be time-consuming or inconclusive. As a result of these factors, a product liability claim, even if successfully defended, could have a material adverse effect on Mirna's business, financial condition or results of operations.

Mirna has product liability insurance that the company feels is appropriate for its stage of development, which covers clinical trials in the United States, for up to $1 million per occurrence, up to an aggregate limit of $5 million; however, Mirna's insurance may be insufficient to reimburse the company for any expenses or losses it may suffer. Mirna's product liability insurance policy for clinical trials completed in the United States expires on December 31, 2017. In addition, Mirna has product liability insurance, which covers clinical trials in the Republic of Korea, for up to KRW 625,000,000 per occurrence, or approximately $500,000, up to an aggregate

limit of KRW 2,500,000,000 or approximately $2,000,000. Mirna's product liability insurance policy for clinical trials completed in the Republic of Korea expires on October 11, 2017. Mirna does not know whether it will be able to continue to obtain product liability coverage and obtain expanded coverage if the company requires it, in sufficient amounts to protect it against losses due to liability, on acceptable terms, or at all. Mirna may not have sufficient resources to pay for any liabilities resulting from a claim excluded from, or beyond the limits of, the company's insurance coverage. Where Mirna has provided indemnities in favor of third parties under its agreements with them, there is also a risk that these third parties could incur liability and bring a claim under such indemnities. An individual may bring a product liability claim against the company alleging that one of Mirna's product candidates or products causes, or is claimed to have caused, an injury or is found to be unsuitable for consumer use. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability and a breach of warranties. Claims could also be asserted under state consumer protection acts. Any product liability claim brought against Mirna, with or without merit, could result in:

- initiation of investigations by regulators;
- substantial costs of litigation, including monetary awards to patients or other claimants;
- liabilities that substantially exceed Mirna's product liability insurance, which the company would then be required to pay itself;
- an increase in Mirna's product liability insurance rates or the inability to maintain insurance coverage in the future on acceptable terms, if at all;
- the diversion of management's attention from the company's business; and
- damage to Mirna's reputation and the reputation of its products and technology.

Product liability claims may subject Mirna to the foregoing and other risks, which could have a material adverse effect on Mirna's business, financial condition, results of operations and prospects.

Risks Related to Mirna's Reliance on Third Parties

If Mirna attempts to form collaborations in the future with respect to its product candidates, it may not be able to do so.

Mirna may attempt to form strategic alliances, create joint ventures or collaborations or enter into licensing arrangements with third parties with respect to its programs that the company believes will complement or augment its existing business. Mirna may face significant competition in seeking appropriate strategic partners, and the negotiation process to secure appropriate terms is time-consuming and complex. Mirna may not be successful in its efforts to establish such a strategic partnership for any product candidates and programs on terms that are acceptable to it, or at all. This may be because Mirna's product candidates and programs may be deemed to be at too early of a stage of development for collaborative effort, Mirna's research and development pipeline may be viewed as insufficient, the competitive or intellectual property landscape may be viewed as too intense or risky, and/or third parties may not view Mirna's product candidates and programs as having sufficient potential for commercialization, including the likelihood of an adequate safety and efficacy profile.

If Mirna enters into a collaboration, the company may be unable to realize the potential benefits of any collaboration.

If Mirna enters into a collaboration with respect to the development and/or commercialization of one or more product candidates, there is no guarantee that the collaboration would be successful. Collaborations may pose a number of risks, including:

- collaborators often have significant discretion in determining the efforts and resources that they will apply to the collaboration, and may not commit sufficient resources to the development, marketing or commercialization of the product or products that are subject to the collaboration;

- collaborators may not perform their obligations as expected;
- any such collaboration may require Mirna to relinquish potentially valuable rights to its current product candidates, potential products or proprietary technologies or grant licenses on terms that are not favorable to Mirna;
- collaborators may cease to devote resources to the development or commercialization of Mirna's product candidates if the collaborators view Mirna's product candidates as competitive with their own products or product candidates;
- disagreements with collaborators, including disagreements over proprietary rights, contract interpretation or the course of development, might cause delays or termination of the development or commercialization of product candidates, and might result in legal proceedings, which would be time-consuming, distracting and expensive;
- collaborators may be impacted by changes in their strategic focus or available funding, or business combinations involving them, which could cause them to divert resources away from the collaboration;
- collaborators may infringe the intellectual property rights of third parties, which may expose Mirna to litigation and potential liability;
- the collaborations may not result in Mirna achieving revenues to justify such transactions; and
- collaborations may be terminated and, if terminated, may result in a need for Mirna to raise additional capital to resume further development or commercialization of the applicable product candidate.

As a result, a collaboration may not result in the successful development or commercialization of Mirna's product candidates.

Reliance on government funding for Mirna's programs may add uncertainty to Mirna's research and commercialization efforts with respect to those programs that are tied to such funding and may impose requirements that limit Mirna's ability to take certain actions, increase the costs of commercialization and production of product candidates developed under those programs and subject Mirna to potential financial penalties, which could materially and adversely affect the company's business, financial condition and results of operations.

During the course of Mirna's development of the company's product candidates, Mirna has been funded in significant part through federal and state grants, including but not limited to the funding Mirna has received from the Texas Emerging Technology Fund and the Cancer Prevention and Research Institute of Texas ("CPRIT"). In addition to the funding Mirna has received to date, the company has in the past applied for federal and state grants to receive additional funding. Contracts and grants funded by the U.S. government, state governments and their related agencies, including the company's contracts with the State of Texas pertaining to funds Mirna has already received, include provisions that reflect the government's substantial rights and remedies, many of which are not typically found in commercial contracts, including powers of the government to:

- terminate agreements, in whole or in part, for any reason or no reason;
- reduce or modify the government's obligations under such agreements without the consent of the other party;
- claim rights, including intellectual property rights, in products and data developed under such agreements;
- audit contract-related costs and fees, including allocated indirect costs;
- suspend the contractor or grantee from receiving new contracts pending resolution of alleged violations of procurement laws or regulations;

- impose U.S. manufacturing requirements for products that embody inventions conceived or first reduced to practice under such agreements;
- impose qualifications for the engagement of manufacturers, suppliers and other contractors as well as other criteria for reimbursements;
- suspend or debar the contractor or grantee from doing future business with the government;
- control and potentially prohibit the export of products;
- pursue criminal or civil remedies under the False Claims Act, False Statements Act and similar remedy provisions specific to government agreements; and
- limit the government's financial liability to amounts appropriated by the U.S. Congress on a fiscal year basis, thereby leaving some uncertainty about the future availability of funding for a program even after it has been funded for an initial period.

In addition to those powers set forth above, the government funding Mirna may receive could also impose requirements to make payments based upon sales of Mirna's products in the future, if any. For example, under the terms of Mirna's 2010 award from CPRIT, Mirna is required to pay CPRIT a portion of Mirna's revenues from sales of certain products by Mirna, or received from Mirna's licensees or sublicensees, at a percentage in the low single digits until the aggregate amount of such payments equals a specified multiple of the grant amount, and thereafter at a rate of less than one percent, subject to Mirna's right, under certain circumstances, to make a one-time payment in a specified amount to CPRIT to buy out such payment obligations. See also the section entitled *"Mirna Business—Strategic Partnerships and Licenses"* in this proxy statement/prospectus/information statement for a description of this CPRIT agreement, which includes a description of Mirna's obligations to make royalty payments.

Mirna may not have the right to prohibit the U.S. government from using certain technologies developed by the company, and Mirna may not be able to prohibit third-party companies, including its competitors, from using those technologies in providing products and services to the U.S. government. The U.S. government generally takes the position that it has the right to royalty-free use of technologies that are developed under U.S. government contracts. These and other provisions of government grants may also apply to intellectual property Mirna licenses now or in the future.

In addition, government contracts and grants normally contain additional requirements that may increase Mirna's costs of doing business, reduce the company's profits, and expose Mirna to liability for failure to comply with these terms and conditions. These requirements include, for example:

- specialized accounting systems unique to government contracts and grants;
- mandatory financial audits and potential liability for price adjustments or recoupment of government funds after such funds have been spent;
- public disclosures of certain contract and grant information, which may enable competitors to gain insights into Mirna's research program; and
- mandatory socioeconomic compliance requirements, including labor standards, nondiscrimination and affirmative action programs and environmental compliance requirements.

If Mirna fails to maintain compliance with any such requirements that may apply to the company now or in the future, Mirna may be subject to potential liability and to termination of the company's contracts.

Risks Related to Mirna's Intellectual Property

If Mirna is sued for infringing the patent rights or misappropriating the trade secrets of third parties, such litigation could be costly and time consuming.

It is possible that Mirna has failed to identify relevant third-party patents or applications. For example, applications filed before November 29, 2000 and certain applications filed after that date that will not be filed outside the United States remain confidential until patents issue. Moreover, it is difficult for industry participants, including Mirna, to identify all third-party patent rights that may be relevant to its product candidates and technologies because patent searching is imperfect due to differences in terminology among patents, incomplete databases and the difficulty in assessing the meaning of patent claims. Mirna may fail to identify relevant patents or patent applications or may identify pending patent applications of potential interest but incorrectly predict the likelihood that such patent applications may issue with claims of relevance to Mirna's technology. In addition, Mirna may be unaware of one or more issued patents that would be infringed by the manufacture, sale or use of a current or future product candidate, or Mirna may incorrectly conclude that a third-party patent is invalid, unenforceable or not infringed by Mirna's activities. Additionally, pending patent applications that have been published can, subject to certain limitations, be later amended in a manner that could cover Mirna's technologies or products or the use of Mirna's products.

There is a substantial amount of intellectual property litigation in the biotechnology and pharmaceutical industries, and Mirna may become party to, or threatened with, litigation or other adversarial proceedings regarding patent rights with respect to Mirna's technology or products candidates, including interferences, oppositions and *inter partes* review proceedings before the U.S. Patent and Trademark Office ("USPTO") and corresponding foreign patent offices. Mirna also monitors patent prosecution activities and pending applications of competitors and potential competitors in its field in order to identify third party patent rights that could pose a potential threat to Mirna's freedom to operate in the market with respect to the company's product candidates, once commercialized. Mirna may in the future pursue available administrative proceedings in the U.S. or foreign patent offices to challenge third party patent rights that could adversely impact Mirna's ability to commercialize one or more of its product candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that Mirna's current or future product candidates may be subject to claims of infringement of the patent rights of third parties, who may assert infringement claims against Mirna based on existing or future patent rights. Third parties may assert that Mirna is employing their proprietary technology without authorization. There may be third-party patents or patent applications with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of Mirna's product candidates and third parties could allege that Mirna's technology infringes such claims. Further, because patent applications can take many years to issue, third parties may have currently pending patent applications which may later result in issued patents that Mirna's product candidates may infringe, or which such third parties claim are infringed by the use of Mirna's technologies. The outcome of patent litigation is subject to uncertainties that cannot be adequately quantified in advance. The pharmaceutical and biotechnology industries have produced a significant number of patents, and it may not always be clear to industry participants, including Mirna, which patents cover various types of products or methods of use. The coverage of patents is subject to interpretation by the courts, and the interpretation is not always uniform. If Mirna is sued for patent infringement, the company would need to demonstrate that its product candidates, products or methods either do not infringe the patent claims of the relevant patent or that the patent claims are invalid, and Mirna may not be able to do this. Proving that a patent is invalid is difficult. For example, in the United States, proving invalidity requires a showing of clear and convincing evidence to overcome the presumption of validity enjoyed by issued patents. Even if Mirna is successful in these proceedings, Mirna may incur substantial costs and the time and attention of the company's management and scientific personnel could be diverted in pursuing these proceedings, which could have a material adverse effect on it. In addition, Mirna may not have sufficient resources to bring these actions to a successful conclusion.

If Mirna is found to infringe a third party's patent rights, the company could be forced, including by court order, to cease developing, manufacturing or commercializing the infringing product candidate or product.

Alternatively, Mirna may be required to obtain a license from such third party in order to use the infringing technology and continue developing, manufacturing or marketing the infringing product candidate. However, Mirna may not be able to obtain any required license on commercially reasonable terms or at all. Even if Mirna were able to obtain a license, it could be non-exclusive, thereby giving the company's competitors access to the same technologies licensed to the company. In addition, Mirna could be found liable for monetary damages, including treble damages and attorneys' fees if Mirna is found to have willfully infringed a patent. A finding of infringement could prevent Mirna from commercializing its product candidates or force Mirna to cease some of its business operations, which could materially harm the company's business. Claims that Mirna has misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on Mirna's business.

Parties making claims against Mirna for infringement of their patent rights may obtain injunctive or other equitable relief, which could effectively block Mirna's ability to further develop and commercialize one or more of Mirna's product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from Mirna's business. In the event of a successful claim of infringement against Mirna, the company could be required to redesign its infringing products or obtain a license from such third party to continue developing and commercializing the company's products and technology. However, Mirna may not be able to obtain any required license on commercially reasonable terms, or at all. Even if Mirna is able to obtain a license, it may be non-exclusive, thereby giving Mirna's competitors access to the same technologies licensed to Mirna. It may be impossible to redesign Mirna's products and technology, or it may require substantial time and monetary expenditure, which could force Mirna to cease some of its business operations, which could materially harm Mirna's business. In addition, in any such proceeding, Mirna may be required to pay substantial damages, including treble damages and attorneys' fees in the event the company found liable for willful infringement.

If Mirna breaches any of the agreements under which it licenses patent rights to use, develop and commercialize Mirna's product candidates or its technologies from third parties or, in certain cases, Mirna fails to meet certain development deadlines, the company could lose license rights that are important to its business.

Mirna is a party to certain license agreements under which the company is granted rights to intellectual property that are important to Mirna's business and Mirna expects that it may need to enter into additional license agreements in the future, if it resumes research and development activities, which have been discontinued. These include Mirna's exclusive cross-license agreement with Asuragen and its exclusive license from Rosetta Genomics Ltd. ("Rosetta Genomics").

Mirna's existing license agreements, except its cross-license agreement with Asuragen, generally impose, and Mirna expects that future license agreements, if any, would impose on it, various development, regulatory and/or commercial diligence obligations, and financial obligations, such as payment of milestones and/or royalties. If Mirna fails to comply with its obligations under its license agreements, or the company is subject to a bankruptcy, the licensor may have the right to terminate the license, in which event Mirna may not be able to market products covered by the license. Mirna's business could suffer, for example, if any current or future licenses terminate, if the licensors fail to abide by the terms of the license, if the licensed patents or other rights are found to be invalid or unenforceable, or if Mirna is unable to enter into necessary licenses on acceptable terms.

As Mirna has done previously, if it commences research and development of product candidates, Mirna may need to obtain licenses from third parties to advance research or allow commercialization of product candidates, and Mirna cannot provide any assurances that third-party patents do not exist that might be enforced against Mirna's current product candidates or future products in the absence of such a license. Mirna may fail to obtain any of these licenses on commercially reasonable terms, if at all. Even if Mirna is able to obtain a license, it may be non-exclusive, thereby giving Mirna's competitors access to the same technologies licensed to the company.

In that event, Mirna may be required to expend significant time and resources to develop or license replacement technology, if Mirna resumes its research and development activities. If it is unable to do so, Mirna may be unable to develop or commercialize the affected product candidates, which could materially harm the company's business and the third parties owning such intellectual property rights could seek either an injunction prohibiting Mirna's sales, or, with respect to Mirna's sales, an obligation on Mirna's part to pay royalties and/or other forms of compensation. Licensing of intellectual property is of critical importance to Mirna's business and involves complex legal, business and scientific issues. Disputes may arise between Mirna and its licensors regarding intellectual property subject to a license agreement, including:

- the scope of rights granted under the license agreement and other interpretation related issues;
- whether and the extent to which Mirna's technology and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- Mirna's right to sublicense patent and other rights to third parties under collaborative development relationships;
- Mirna's diligence obligations with respect to the use of the licensed technology in relation to Mirna's development and commercialization of its product candidates, and what activities satisfy those diligence obligations; and
- the ownership of inventions and know how resulting from the joint creation or use of intellectual property by Mirna's licensors and Mirna and its partners.

If disputes over intellectual property that Mirna has licensed arise, Mirna would expect to exercise all rights and remedies available to it, including seeking to cure any breach by Mirna, and otherwise seek to preserve Mirna's rights under the patents licensed to Mirna. However, the company may not be able to do so in a timely manner, at an acceptable cost or at all. Generally, the loss of any one of Mirna's current licenses, or any other license Mirna may acquire in the future, could prevent or impair the company's ability to successfully develop and commercialize the affected product candidates and thus materially harm Mirna's business, prospects, financial condition and results of operations.

Mirna may be subject to claims challenging the inventorship or ownership of its patents and other intellectual property.

Mirna was previously involved in discussions with Yale University ("Yale"), regarding the inventorship and ownership of certain patents and patent applications licensed to Mirna by Asuragen. An independent third party expert was engaged to determine the inventorship and the ownership of patents and patent applications potentially subject to Yale and Asuragen co-ownership. This determination confirmed Asuragen's sole ownership of the patents and patent applications where co-ownership had been under consideration and resulted in a determination that Yale should be removed as a co-owner of one of the pending patent applications.

Although Mirna seeks to protect its ownership of its patents and other intellectual property by ensuring that the company's agreements with its employees and certain collaborators and other third parties with whom Mirna does business include provisions requiring, for instance, such parties to assign rights in inventions to Mirna, Mirna may be subject to claims that former or current employees, collaborators or other third parties have an ownership interest in Mirna's patents, in-licensed patents or other intellectual property. In some situations, Mirna's confidentiality agreements may conflict with, or be subject to, the rights of third parties with whom Mirna's employees, consultants or advisors have previous employment or consulting relationships, and further, many of Mirna's consultants are currently retained by other biotechnology or pharmaceutical companies, including the company's competitors or potential competitors, and may be subject to conflicting obligations to these third parties. To the extent that Mirna's employees, consultants or contractors use any intellectual property owned by third parties in their work for Mirna, disputes may arise as to the ownership of rights in any related or resulting know-how and inventions, arising, for example, from such conflicting obligations of consultants,

employees or others who are involved in developing Mirna's product candidates. Litigation may be necessary to defend against these and other claims challenging inventorship or ownership. If Mirna fails in defending any such claims, in addition to paying monetary damages, Mirna may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on Mirna's business. Even if Mirna is successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

Obtaining and maintaining patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and Mirna's patent protection could be reduced or eliminated for non-compliance with these requirements.

The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent prosecution process. Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or patent applications will be due to be paid to the USPTO and various patent agencies outside of the United States in several stages over the lifetime of the patents and/or applications. Mirna has systems in place to remind it to pay these fees, and the company employs reputable law firms and other professionals and rely on such third parties to effect payment of these fees with respect to the USPTO and non-U.S. patent agencies with respect to the patents and patent applications Mirna owns, and the company relies upon its licensors to effect payment of these fees with respect to the patents and patent applications that Mirna in-licenses. Even if Mirna does not control prosecution and maintenance of Mirna's in-licensed patents, Mirna may be responsible for reimbursing its licensors for some or all of the costs associated with such activities. If Mirna fails to make timely payment to its licensors for such fees, its licensors may have the right to terminate the affected license, in which event Mirna would not be able to market products covered by the license. Mirna also employs reputable law firms and other professionals to help it comply with the various documentary and other procedural requirements with respect to the patents and patent applications that Mirna owns. In some cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. However, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, Mirna's competitors might be able to enter the market and this circumstance would have a material adverse effect on Mirna's business.

Mirna may be subject to claims that its employees or consultants or independent contractors have wrongfully used or disclosed confidential information or trade secrets of third parties or that its employees or consultants have wrongfully used or disclosed alleged trade secrets of former or other employers.

Many of Mirna's employees, independent contractors and consultants, including the company's senior management, have been previously employed or retained by other biotechnology or pharmaceutical companies, including the company's competitors or potential competitors. Although Mirna tries to ensure that its employees, consultants and independent contractors do not use the proprietary information or know-how of third parties in their work for Mirna, and do not perform work for the company that is in conflict with their obligations to another employer or any other entity, Mirna may be subject to claims that it or its employees, consultants or independent contractors have inadvertently or otherwise improperly used or disclosed confidential information, including trade secrets or other proprietary information, of a former employer or other third parties. Mirna may also be subject to claims that an employee, advisor, consultant, or independent contractor performed work for the company that conflicts with that person's obligations to a third party, such as an employer, and thus, that the third party has an ownership interest in the intellectual property arising out of work performed for the company. Mirna is not aware of any threatened or pending claims related to these matters, but in the future litigation may be necessary to defend against such claims. If Mirna fails in defending any such claims, in addition to paying monetary damages, Mirna may lose valuable personnel or intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on the company's business. Even if Mirna is successful in defending against such claims, litigation could result in substantial costs and be a distraction to management.

Intellectual property disputes could cause Mirna to spend substantial resources and distract the company's personnel from their normal responsibilities.

Even if resolved in the company's favor, litigation or other legal proceedings relating to intellectual property claims may cause Mirna to incur significant expenses, and could distract the company's technical and/or management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the market price of Mirna Common Stock. Such litigation or proceedings could substantially increase the company's operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. Mirna may not have sufficient financial or other resources to adequately conduct such litigation or proceedings. Some of Mirna's competitors may be able to sustain the costs of such litigation or proceedings more effectively than Mirna can because of such competitors' greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on the company's ability to compete in the marketplace.

Risks Related to the Mirna Common Stock

Mirna's stock price is volatile and Mirna Stockholders may not be able to resell shares of Mirna Common Stock at or above the price they paid.

The trading price of Mirna Common Stock is highly volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond the company's control. These factors include those discussed in this "Risk Factors" section of this proxy statement/prospectus/information statement and others such as:

- announcements relating to the Merger or any other strategic transaction;
- announcements relating to collaborations that Mirna may enter into with respect to the development or commercialization of Mirna's product candidates;
- announcements relating to the receipt, modification or termination of government contracts or grants;
- product liability claims related to Mirna's clinical trials or product candidates;
- prevailing economic conditions;
- additions or departures of key personnel;
- business disruptions caused by earthquakes or other natural disasters;
- disputes concerning Mirna's intellectual property or other proprietary rights;
- FDA or other U.S. or foreign regulatory actions affecting Mirna or its industry;
- sales of Mirna Common Stock by the company, its executive officers and directors or Mirna Stockholders in the future;
- future sales or issuances of equity or debt securities by us;
- lack of an active, liquid and orderly market in the Mirna Common Stock;
- fluctuations in Mirna's quarterly operating results; and
- the issuance of new or changed securities analysts' reports or recommendations regarding Mirna.

In addition, the stock markets in general, and the markets for pharmaceutical, biopharmaceutical and biotechnology stocks in particular, have experienced extreme volatility that have been often unrelated to the operating performance of the issuer. These broad market fluctuations may adversely affect the trading price or liquidity of the Mirna Common Stock. In the past, when the market price of a stock has been volatile, holders of

that stock have sometimes instituted securities class action litigation against the issuer. If any of the Mirna Stockholders were to bring such a lawsuit against Mirna, the company could incur substantial costs defending the lawsuit and the attention of Mirna's management would be diverted from the operation of the company's business.

The Mirna Common Stock may be delisted from the NASDAQ Global Market if Mirna is unable to maintain compliance with NASDAQ's continued listing standards.

NASDAQ imposes, among other requirements, continued listing standards including minimum bid and public float requirements. The price of the Mirna Common Stock must trade at or above $1.00 to comply with NASDAQ's minimum bid requirement for continued listing on the NASDAQ Global Market. If Mirna's stock trades at bid prices of less than $1.00 for a period in excess of 30 consecutive business days, NASDAQ could send a deficiency notice to the company for not remaining in compliance with the minimum bid listing standards. During the first quarter of fiscal year 2017, the Mirna Common Stock never traded below $1.00. However, if the closing bid price of the Mirna Common Stock fails to meet NASDAQ's minimum closing bid price requirement, or if Mirna otherwise fails to meet any other applicable requirements of NASDAQ and Mirna is unable to regain compliance, NASDAQ may make a determination to delist the Mirna Common Stock.

Any delisting of the Mirna Common Stock could adversely affect the market liquidity of the Mirna Common Stock and the market price of the Mirna Common Stock could decrease. Furthermore, if the Mirna Common Stock were delisted it could adversely affect Mirna's ability to obtain financing for the continuation of the company's operations and/or result in the loss of confidence by investors, customers, suppliers and employees.

Mirna's principal stockholders and management own a significant percentage of Mirna's stock and are able to exert significant control over matters subject to stockholder approval.

Based on the beneficial ownership of the Mirna Common Stock as of May 31, 2017, Mirna's officers and directors, together with holders of 5% or more of the Mirna Common Stock outstanding and their respective affiliates, beneficially own approximately 68% of Mirna Common Stock. Accordingly, these stockholders have significant influence over the outcome of corporate actions requiring stockholder approval, including the election of directors, the Merger, consolidation or sale of all or substantially all of Mirna's assets or any other significant corporate transaction. The interests of these stockholders may not be the same as or may even conflict with your interests. For example, these stockholders could delay or prevent a change of control of the company, even if such a change of control would benefit the other Mirna Stockholders, which could deprive Mirna Stockholders of an opportunity to receive a premium for their Mirna Common Stock as part of a sale of the company or its assets and might affect the prevailing market price of the Mirna Common Stock. The significant concentration of stock ownership may adversely affect the trading price of the Mirna Common Stock due to investors' perception that conflicts of interest may exist or arise.

Mirna is an "emerging growth company" and it cannot be certain if the reduced disclosure requirements applicable to emerging growth companies will make the Mirna Common Stock less attractive to investors.

Mirna is an "emerging growth company," as defined in the JOBS Act, and may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not "emerging growth companies" including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in Mirna's periodic reports and proxy statements and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. Mirna cannot predict if investors will find the Mirna Common Stock less attractive because Mirna may rely on these exemptions. If some investors find the Mirna Common Stock less attractive as a result, there may be a less active trading market for the Mirna Common Stock and Mirna's stock price may be more volatile.

In addition, Section 102 of the JOBS Act also provides that an "emerging growth company" can take advantage of the extended transition period provided in Section 7(a)(2)(B) of the Securities Act for complying with new or revised accounting standards. An "emerging growth company" can therefore delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. However, Mirna is choosing to "opt out" of such extended transition period, and as a result, Mirna will comply with new or revised accounting standards on the relevant dates on which adoption of such standards is required for non-emerging growth companies. Section 107 of the JOBS Act provides that Mirna's decision to opt out of the extended transition period for complying with new or revised accounting standards is irrevocable.

Future sales of Mirna Common Stock or securities convertible or exchangeable for Mirna Common Stock may depress Mirna's stock price.

If the existing Mirna Stockholders or holders of Mirna's options sell, or indicate an intention to sell, substantial amounts of Mirna Common Stock in the public market, the trading price of Mirna Common Stock could decline. The perception in the market that these sales may occur could also cause the trading price of Mirna Common Stock to decline. As of May 31, 2017, there are a total of 20,856,693 shares of Mirna Common Stock outstanding.

In addition, based on the number of shares subject to outstanding awards under Mirna's 2008 Long Term Incentive Plan (the "2008 Stock Plan"), as of May 31, 2017, and including the initial reserves under the Mirna 2015 Plan and Mirna's Employee Stock Purchase Plan (the "ESPP"), approximately 5.1 million shares of Mirna Common Stock that are either subject to outstanding options, outstanding but subject to vesting, or reserved for future issuance under the 2008 Stock Plan, Mirna 2015 Plan or ESPP will become eligible for sale in the public market to the extent permitted by the provisions of various vesting schedules. Mirna also filed a registration statement permitting certain shares of Mirna Common Stock issued in the future pursuant to the 2008 Plan, Mirna 2015 Plan and ESPP to be freely resold by plan participants in the public market, subject to the applicable vesting schedules and, for shares held by directors, executive officers and other affiliates, volume limitations under Rule 144 under the Securities Act. The Mirna 2015 Plan and ESPP also contain provisions for the annual increase of the number of shares reserved for issuance under such plans, which shares Mirna also intends to register. If the shares Mirna may issue from time to time under the 2008 Stock Plan, Mirna 2015 Plan or ESPP are sold, or if it is perceived that they will be sold, by the award recipient in the public market, the trading price of Mirna Common Stock could decline.

An active, liquid and orderly market for shares of Mirna Common Stock may not be sustained.

Prior to Mirna's IPO in October 2015, there had been no public market for the Mirna Common Stock, and an active public market for Mirna's shares may not be sustained. Further, certain of Mirna's existing institutional investors, including investors affiliated with certain of the company's directors, purchased approximately 2.4 million shares of Mirna Common Stock in the company's IPO and consequently fewer shares may be actively traded in the public market because these stockholders are restricted from selling the shares by restrictions under applicable securities laws, which would reduce the liquidity of the market for the Mirna Common Stock. If an active market for shares of Mirna Common Stock is not maintained it may be difficult for Mirna Stockholders to sell their shares at the time they wish to sell them or at a price that they consider reasonable or it may result in volatility in Mirna's stock price. An inactive market may also impair Mirna's ability to raise capital by selling shares and may impair Mirna's ability to acquire other businesses or technologies or in-license new product candidates using Mirna's shares as consideration.

Mirna's quarterly operating results may fluctuate significantly or may fall below the expectations of investors or securities analysts, each of which may cause Mirna's stock price to fluctuate or decline.

Mirna expects its operating results to be subject to quarterly fluctuations. Mirna's net loss and other operating results will be affected by numerous factors, including:

- variations in the level of the company's operating expenses;

- receipt, modification or termination of government contracts or grants, and the timing of payments Mirna receives under these arrangements;
- Mirna's execution of any collaborative, licensing or similar arrangements, and the timing of payments Mirna may make under these arrangements; and
- any intellectual property infringement lawsuit or opposition, interference or cancellation proceeding in which Mirna may become involved.

If Mirna's quarterly operating results fall below the expectations of investors or securities analysts, the price of Mirna Common Stock could decline substantially. Furthermore, any quarterly fluctuations in Mirna's operating results may, in turn, cause the price of the company's stock to fluctuate substantially. Mirna believes that quarterly comparisons of its financial results are not necessarily meaningful and should not be relied upon as an indication of the company's future performance.

Provisions of Mirna's charter documents or Delaware law could delay or prevent an acquisition of the company, even if the acquisition would be beneficial to Mirna Stockholders, and could make it more difficult for you to change management.

Provisions in Mirna's amended and restated certificate of incorporation and Mirna's amended and restated bylaws may discourage, delay or prevent a merger, acquisition or other change in control that Mirna Stockholders may consider favorable, including transactions in which Mirna Stockholders might otherwise receive a premium for their shares. In addition, these provisions may frustrate or prevent any attempt by Mirna Stockholders to replace or remove the company's current management by making it more difficult to replace or remove the Mirna Board of Directors. These provisions include:

- a classified board of directors so that not all directors are elected at one time;
- a prohibition on stockholder action through written consent;
- no cumulative voting in the election of directors;
- the exclusive right of the Mirna Board of Directors to elect a director to fill a vacancy created by the expansion of the Mirna Board of Directors or the resignation, death or removal of a director;
- a requirement that special meetings of Mirna Stockholders be called only by the Mirna Board of Directors, the chairman of the Mirna Board of Directors, the chief executive officer or, in the absence of a chief executive officer, the president;
- an advance notice requirement for stockholder proposals and nominations;
- the authority of the Mirna Board of Directors to issue preferred stock with such terms as the Mirna Board of Directors may determine; and
- a requirement of approval of not less than 66 2/3% of all outstanding shares of Mirna's capital stock entitled to vote to amend any bylaws by stockholder action, or to amend specific provisions of Mirna's certificate of incorporation.

In addition, Delaware law prohibits a publicly held Delaware corporation from engaging in a business combination with an interested stockholder, generally a person who, together with its affiliates, owns or within the last three years has owned 15% or more of the company's voting stock, for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in a prescribed manner. Accordingly, Delaware law may discourage, delay or prevent a change in control of the company. Furthermore, Mirna's amended and restated certificate of incorporation specifies that the Court of Chancery of the State of Delaware will be the sole and exclusive forum for most legal actions involving actions brought against Mirna by Mirna Stockholders. Mirna believes this provision benefits the company by providing increased consistency in the application of Delaware law by chancellors particularly experienced in

resolving corporate disputes, efficient administration of cases on a more expedited schedule relative to other forums and protection against the burdens of multi-forum litigation. However, the provision may have the effect of discouraging lawsuits against Mirna's directors and officers. The enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that, in connection with any applicable action brought against Mirna, a court could find the choice of forum provisions contained in Mirna's amended and restated certificate of incorporation to be inapplicable or unenforceable in such action.

Provisions in Mirna's charter and other provisions of Delaware law could limit the price that investors are willing to pay in the future for shares of Mirna Common Stock.

Mirna's employment agreements with its officers may require the company to pay severance benefits to any of those persons who are terminated in connection with a change of control of Mirna, which could harm its business, financial condition or results of operations.

Mirna's current executive officers are parties to employment agreements providing for aggregate cash payments of up to approximately $1.9 million at March 31, 2017 for severance and other benefits in the event of a termination of employment in connection with a change of control of Mirna. The payment of these severance benefits could harm Mirna's business, financial condition and results of operations. In addition, these potential severance payments may discourage or prevent third parties from seeking a business combination with Mirna.

Mirna does not anticipate paying any cash dividends on Mirna Common Stock in the foreseeable future; therefore, capital appreciation, if any, of Mirna Common Stock will be your sole source of gain for the foreseeable future.

Mirna has never declared or paid cash dividends on Mirna Common Stock. Mirna does not anticipate paying any cash dividends on Mirna Common Stock in the foreseeable future. Mirna currently intends to retain all available funds and any future earnings to fund its operations. In addition, the terms of any future debt financing arrangement may contain terms prohibiting or limiting the amount of dividends that may be declared or paid on Mirna Common Stock. As a result, capital appreciation, if any, of Mirna Common Stock will be your sole source of gain for the foreseeable future.

If securities or industry analysts do not publish research, or publish inaccurate or unfavorable research, about Mirna's business, Mirna's stock price and trading volume could decline.

The trading market for Mirna Common Stock will depend, in part, on the research and reports that securities or industry analysts publish about Mirna or its business. Securities and industry analysts do not currently, and may never, publish research on the company. If no securities or industry analysts commence coverage of the company, the trading price for Mirna Common Stock would likely be negatively impacted. In the event securities or industry analysts initiate coverage, if one or more of the analysts who cover Mirna downgrade the Mirna Common Stock or publish inaccurate or unfavorable research about Mirna's business, its stock price would likely decline. In addition, if the company's operating results fail to meet the forecast of analysts, its stock price would likely decline. If one or more of these analysts cease coverage of the company or fail to publish reports on Mirna regularly, demand for Mirna Common Stock could decrease, which might cause Mirna's stock price and trading volume to decline.

Changes in, or interpretations of, accounting rules and regulations could result in unfavorable accounting charges or require Mirna to change its compensation policies.

Accounting methods and policies for biopharmaceutical companies, including policies governing revenue recognition, research and development and related expenses and accounting for stock-based compensation, are subject to further review, interpretation and guidance from relevant accounting authorities, including the SEC. Changes to, or interpretations of, accounting methods or policies may require Mirna to reclassify, restate or otherwise change or revise its financial statements, including those contained in this periodic report.

Risks Related to Synlogic's Financial Condition and Capital Requirements

Synlogic is a clinical-stage biopharmaceutical company with a history of losses, and it expects to continue to incur losses for the foreseeable future, and it may never achieve or maintain profitability.

Synlogic is a clinical-stage biopharmaceutical company focused on the development of Synthetic Biotics and it has incurred significant operating losses since its inception in 2014. Synlogic's net loss was $21.0 million and $8.5 million for the fiscal years ended December 31, 2016 and 2015, respectively, and $7.4 million for the fiscal quarter ended March 31, 2017. As of March 31, 2017, Synlogic had an accumulated deficit of $38.6 million. To date, Synlogic has not generated any product revenue. Substantially all of Synlogic's losses have resulted from expenses incurred in connection with its research and development programs and from general and administrative costs associated with its operations. Synlogic has no products on the market and it has initiated clinical development for only one product candidate, SYNB1020, and expects that it will be many years, if ever, before Synlogic has a product candidate ready for commercialization.

Synlogic has not generated, and does not expect to generate, any product revenue for the foreseeable future, and Synlogic expects to continue to incur significant operating losses for the foreseeable future due to the cost of research and development, preclinical studies and clinical trials, the regulatory review process for product candidates, and the development of manufacturing and marketing capabilities for any product candidates approved for commercial sale. The amount of Synlogic's potential future losses is uncertain. To achieve profitability, Synlogic must successfully develop product candidates, obtain regulatory approvals to market and commercialize product candidates, manufacture any approved product candidates on commercially reasonable terms, establish a sales and marketing organization or suitable third-party alternatives for any approved product candidates and raise sufficient funds to finance its business activities. Synlogic may never succeed in these activities and, even if it does, may never generate revenues that are significant or large enough to achieve profitability. Even if Synlogic does achieve profitability, it may not be able to sustain or increase profitability on a quarterly or annual basis. Synlogic's failure to become and remain profitable would decrease the value of the company and could impair its ability to raise capital, maintain its research and development efforts, expand its business or continue its operations. A decline in the value of Synlogic could also cause its stockholders to lose all or part of their investment.

Synlogic will require substantial additional funding, which may not be available on acceptable terms, or at all.

Synlogic has used substantial funds to discover and develop its programs and proprietary drug development platform and will require substantial additional funds to conduct further research and development, including preclinical studies and clinical trials of its product candidates, seek regulatory approvals for its product candidates and manufacture and market any products that are approved for commercial sale. Synlogic expects that the capital resources available to it as of March 31, 2017 will be sufficient to meet its anticipated cash requirements for at least the next 12 months. Synlogic's future capital requirements and the period for which it expects its existing resources to support its operations may vary significantly from what Synlogic expects. Synlogic's monthly spending levels vary based on new and ongoing research and development and corporate activities. Because Synlogic cannot be certain of the length of time or activities associated with successful development and commercialization of its product candidates, Synlogic is unable to estimate the actual funds it will require to develop and commercialize them.

Synlogic does not expect to realize any appreciable revenue from product sales or royalties in the foreseeable future, if at all. Synlogic's revenue sources will remain very limited unless and until its product candidates complete clinical development and are approved for commercialization and successfully marketed. To date, Synlogic has primarily financed its operations through sales of its securities and third party collaborations. Synlogic intends to seek additional funding in the future through collaborations, equity or debt financings, credit or loan facilities or a combination of one or more of these financing sources. Synlogic's ability to raise additional funds will depend on financial, economic and other factors, many of which are beyond its control. Additional funds may not be available to Synlogic on acceptable terms or at all. If Synlogic raises additional funds by

issuing equity or convertible debt securities, its stockholders will suffer dilution and the terms of any financing may adversely affect the rights of its stockholders. In addition, as a condition to providing additional funds to Synlogic, future investors may demand, and may be granted, rights superior to those of existing stockholders. Debt financing, if available, may involve restrictive covenants limiting Synlogic's flexibility in conducting future business activities, and, in the event of insolvency, debt holders would be repaid before holders of equity securities received any distribution of corporate assets.

If Synlogic is unable to obtain funding on a timely basis or on acceptable terms, or at all, it may have to delay, limit or terminate its research and development programs and preclinical studies or clinical trials, if any, limit strategic opportunities or undergo reductions in its workforce or other corporate restructuring activities. Synlogic also could be required to seek funds through arrangements with collaborators or others that may require it to relinquish rights to some of its product candidates or technologies that Synlogic would otherwise pursue on its own.

Synlogic's short operating history may make it difficult for stockholders to evaluate the success of its business to date and to assess its future viability.

Synlogic is a clinical-stage biopharmaceutical company with a limited operating history. Synlogic commenced active operations in 2014. Its operations to date have been limited to organizing and staffing its company, research and development activities, business planning and raising capital. Synlogic recently initiated a Phase 1 clinical trial with SYNB1020 in June 2017, but all of Synlogic's other therapeutic programs are still in the preclinical development stage. Synlogic will need to transition from a company with a research focus to a company capable of supporting clinical development and commercial activities. In addition, Synlogic expects to complete pre-clinical studies and to initiate a Phase 1 clinical trial of SYNB1618 in the first half of 2018. Synlogic has not yet demonstrated its ability to successfully complete any clinical trials, including large-scale, pivotal clinical trials, obtain marketing approvals, manufacture a commercial-scale product, or arrange for a third party to do so on its behalf, or conduct sales and marketing activities necessary for successful product commercialization. Typically, it takes many years to develop one new product candidate from the time it is discovered to the time that it becomes available for treating patients. Synlogic may encounter unforeseen expenses, difficulties, complications, delays and other known and unknown factors that may hinder its success in commercializing one or more of its product candidates. Further, drug development is a capital-intensive and highly speculative undertaking that involves a substantial degree of risk. You should consider Synlogic's prospects in light of the costs, uncertainties, delays and difficulties frequently encountered by companies in the early stages of development and clinical trials. Any forward-looking statements regarding Synlogic's future prospects, plans or viability may not be as accurate as they may be if Synlogic had a longer operating history or a history of successfully developing and commercializing pharmaceutical products.

Risks Related to the Development of Synlogic's Product Candidates

Clinical trials are costly, time consuming and inherently risky, and Synlogic may fail to demonstrate safety and efficacy to the satisfaction of applicable regulatory authorities.

Clinical development of a product candidate is expensive, time consuming and involves significant risk. Synlogic cannot guarantee that any clinical trials it undertakes to conduct will be conducted as planned or completed on schedule or at all. A failure of one or more clinical trials can occur at any stage of development. Events that may prevent successful or timely completion of clinical development of Synlogic's product candidates include but are not limited to:

- inability to generate satisfactory pre-clinical or other non-clinical trials, including, toxicology, or other in vivo or in vitro data or diagnostics to support the initiation or continuation of clinical trials;
- delays in reaching agreement on acceptable terms with CROs and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and clinical trial sites;

- delays in obtaining required institutional review board ("IRB") approval at each clinical trial site;
- failure to permit the conduct of a clinical trial by regulatory authorities, after review of an investigational new drug or equivalent foreign application or amendment;
- delays in recruiting qualified patients in its clinical trials;
- failure by clinical sites or CROs or other third parties to adhere to clinical trial requirements;
- failure by Synlogic, clinical sites, CROs or other third parties to perform in accordance with the good clinical practices requirements of the FDA or applicable foreign regulatory guidelines;
- patients dropping out of the clinical trials;
- occurrence of adverse events, unacceptable side effects or toxicity issues associated with Synlogic's product candidates;
- imposition by the FDA of a clinical hold or the requirement by other similar regulatory agencies that one or more clinical trials be delayed or halted;
- changes in regulatory requirements and guidance that require amending or submitting new clinical protocols or performing additional nonclinical studies;
- the cost of clinical trials of Synlogic's product candidates;
- negative or inconclusive results from Synlogic's clinical trials that may result in Synlogic deciding, or regulators requiring Synlogic, to conduct additional clinical trials or abandon such clinical trials and/or clinical trials or development programs in other ongoing or planned indications for a product candidate; and
- delays in reaching agreement on acceptable terms with third-party manufacturers or delays or failure in manufacturing sufficient quantities of its product candidates for use in clinical trials.

Any inability to successfully complete clinical development and obtain regulatory approval for its product candidates could result in additional costs to Synlogic or impair its ability to generate revenue. In addition, if Synlogic makes manufacturing or formulation changes to its product candidates, Synlogic may need to conduct additional pre-clinical studies or the results obtained from such new formulation may not be consistent with previous results obtained. Clinical trial delays could also shorten any anticipated periods of patent exclusivity for Synlogic's product candidates and may allow competitors to develop and bring products to market before Synlogic does, which could impair its ability to successfully commercialize its product candidates and may harm its business and results of operations.

The approach Synlogic is taking to discover and develop novel therapeutics using synthetic biology to create novel medicines is unproven and may never lead to marketable products.

The scientific discoveries that form the basis for Synlogic's efforts to generate and develop its product candidates are relatively recent. The scientific evidence to support the feasibility of developing drugs based on Synlogic's approach is both preliminary and limited. Synthetic Biotics represent a novel therapeutic modality and their successful development by Synlogic may require additional studies and efforts to optimize their therapeutic potential. Any product candidates that Synlogic develops may not demonstrate in patients the therapeutic properties ascribed to them in laboratory and other pre-clinical studies, and they may interact with human biological systems in unforeseen, ineffective or even harmful ways. If Synlogic is not able to successfully develop and commercialize product candidates based upon this technological approach, it may never become profitable and the value of its capital stock may decline.

Synlogic's Synthetic Biotic product candidates are based on a relatively novel technology, which makes it difficult to predict the time and cost of development and of subsequently obtaining regulatory approval, if at all.

Synlogic has concentrated its research and development efforts to date on a limited number of product candidates based on its Synthetic Biotic therapeutic platform and identifying its initial targeted disease indications. Synlogic's future success depends on its successful development of viable product candidates. There can be no assurance that Synlogic will not experience problems or delays in developing its product candidates and that such problems or delays will not cause unanticipated costs, or that any such development problems can be solved.

The clinical trial and manufacturing requirements of the FDA, the European Medicines Agency and other regulatory authorities, and the criteria these regulators use to determine the safety and efficacy of a product candidate, vary substantially according to the type, complexity, novelty and intended use and market of the product candidate. The regulatory approval process for novel product candidates such as Synthetic Biotic therapeutics can be more expensive and take longer than for other, better known or more extensively studied therapeutic modalities. It is difficult to determine how long it will take or how much it will cost to obtain regulatory approvals for Synlogic's product candidates in either the United States or the European Union or how long it will take to commercialize its product candidates, even if approved for marketing. Approvals by the European Commission may not be indicative of what the FDA, and vice versa, may require for approval and different or additional pre-clinical studies or clinical trials may be required to support regulatory approval in each respective jurisdiction. In addition, the FDA has advised Synlogic that the clinical development of SYNB1020 does not require submission to the National Institutes of Health's ("NIH") Recombinant DNA Advisory Committee ("RAC"), a committee that reviews human gene transfer protocols. Nevertheless, if RAC review is deemed necessary by one or more of Synlogic's clinical trial sites that receives NIH funding, its clinical trials could be delayed. Synlogic's product candidates do not involve gene transfers to humans, and Synlogic believes that they do not meet any of the criteria for that that type of review. Delay or failure to obtain, or unexpected costs in obtaining, the regulatory approval necessary to bring a potential product candidate to market could decrease Synlogic's ability to generate sufficient product revenue, and Synlogic's business, financial condition, results of operations and prospects may be harmed.

Synlogic may not be successful in its efforts to use and expand its development platform to build a pipeline of product candidates.

A key element of Synlogic's strategy is to use its targeted focus and experienced management and scientific team to create Synthetic Biotic medicines that can be deployed against a broad range of human disease in order to build a pipeline of product candidates. Although Synlogic's research and development efforts to date have resulted in potential product candidates, Synlogic may not be able to continue to identify and develop additional product candidates. Even if Synlogic is successful in continuing to build its pipeline, the potential product candidates that Synlogic identifies may not be suitable for clinical development. For example, these potential product candidates may be shown to have harmful side effects or other characteristics that indicate that they are unlikely to be drugs that will receive marketing approval and achieve market acceptance. If Synlogic does not successfully develop and commercialize product candidates based upon its approach, Synlogic will not be able to obtain product revenue in future periods, which likely would result in significant harm to its financial position. There is no assurance that Synlogic will be successful in its preclinical and clinical development, and the process of obtaining regulatory approvals will, in any event, require the expenditure of substantial time and financial resources.

Synlogic's product candidates may cause undesirable side effects or have other properties that could delay or prevent their regulatory approval, limit the commercial viability of an approved label, or result in significant negative consequences following marketing approval, if any.

Undesirable side effects caused by its product candidates could cause Synlogic or regulatory authorities to interrupt, delay or terminate Synlogic's clinical trials or result in a restrictive label or delay regulatory approval by the FDA or comparable foreign authorities. Undesirable side effects and negative results for other indications may negatively impact the development and potential for approval of Synlogic's product candidates for their proposed indications.

Additionally, even if one or more of its product candidates receives marketing approval, and Synlogic or others later identify undesirable side effects caused by such products, potentially significant negative consequences could result, including but not limited to:

- regulatory authorities may withdraw approvals of such products;
- regulatory authorities may require additional warnings on the labels of such products;
- Synlogic may be required to create a risk evaluation and mitigation strategy ("REMS") plan, which could include a medication guide outlining the risks of such side effects for distribution to patients, a communication plan for healthcare providers, and/or other elements to assure safe use;
- Synlogic could be sued and held liable for harm caused to patients; and
- Synlogic's reputation may suffer.

Any of these events could prevent Synlogic from achieving or maintaining market acceptance of a product candidate, even if approved, and could significantly harm its business, results of operations, and prospects.

Synlogic's product development program may not uncover all possible adverse events that patients who take its product candidates may experience. The number of subjects exposed to Synlogic's product candidates during clinical trials and the average exposure time in the clinical development program may be inadequate to detect rare adverse events, or chance findings, that may only be detected once the product is administered to more patients and for greater periods of time.

Clinical trials by their nature utilize a sample of the potential patient population. However, with a limited number of patients and limited duration of exposure, Synlogic cannot be fully assured that uncommon or severe side effects of its product candidates will be uncovered. Such side effects may only be uncovered with a significantly larger number of patients exposed to the drug. If such safety problems occur or are identified after a product candidate reaches the market, the FDA may require that Synlogic amend the labeling of the product or recall the product, or may even withdraw approval for the product. Any of these events could prevent Synlogic from achieving or maintaining market acceptance of a product candidate, even if approved, and could significantly harm its business, results of operations, and prospects.

Synlogic is heavily dependent on the success of its product candidates. Some of its product candidates have produced results in pre-clinical settings to date, but none of its product candidates have completed clinical trials, and Synlogic cannot give any assurance that it will generate data for any of its product candidates sufficient to receive regulatory approval in its planned indications, which will be required before they can be commercialized.

Synlogic has invested substantially all of its efforts and financial resources to identify, acquire and develop its portfolio of product candidates. Its future success is dependent on its ability to successfully further develop, obtain regulatory approval for, and commercialize one or more product candidates. Synlogic currently generates no revenue from sales of any products, and Synlogic may never be able to develop or commercialize a product candidate.

In addition, only Synlogic's lead product candidate has advanced into clinical trials, and none of Synlogic's product candidates have advanced into any pivotal clinical trial, for Synlogic's proposed indications and it may be years before any additional clinical trials, including any pivotal clinical trial, are initiated and completed, if at all. Synlogic is not permitted to market or promote any of its product candidates before it receives regulatory approval from the FDA or comparable foreign regulatory authorities, and Synlogic may never receive such regulatory approval for any of its product candidates. Synlogic cannot be certain that any of its product candidates will be successful in clinical trials or receive regulatory approval. Further, its product candidates may not receive regulatory approval even if they are successful in clinical trials. If Synlogic does not receive regulatory approvals for its product candidates, Synlogic may not be able to continue its operations.

If Synlogic fails to obtain or maintain orphan drug exclusivity for some of its products, its competitors may obtain approval to sell the same drugs to treat the same conditions and its revenues will be reduced.

As part of Synlogic's business strategy, it has developed and may in the future develop product candidates that may be eligible for FDA and EU orphan drug designation. In August 2016, FDA granted orphan drug designation to SYN1020 for the treatment of UCD. Under the Orphan Drug Act, the FDA may designate a product as an orphan drug if it is intended to treat, diagnose or prevent rare diseases or conditions that affect fewer than 200,000 people in the United States. In the EU, orphan drug designation may be granted to drugs intended to treat, diagnose or prevent a life-threatening or chronically debilitating disease having a prevalence of no more than five in 10,000 people in the EU. The company that first obtains FDA approval for a designated orphan drug for the associated rare disease receives marketing exclusivity for use of that drug for the stated condition for a period of seven years. Orphan drug exclusive marketing rights may be lost under several circumstances, including a later determination by the FDA that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantity of the drug. Similar regulations are available in the EU with a ten-year period of market exclusivity.

Because the extent and scope of patent protection for some of Synlogic's product candidates is limited, obtaining orphan drug designation is especially important for any product candidates that may be eligible for orphan drug designation. For eligible products, Synlogic plans to rely on the exclusivity period under the Orphan Drug Act to maintain a competitive position. If it does not obtain orphan drug designation for its product candidates that do not have broad patent protection, Synlogic's competitors may then sell the same drug to treat the same condition and Synlogic's revenues, if any, may be adversely affected thereby.

Even though Synlogic has obtained orphan drug designation for its lead product candidate, and intends to seek orphan drug designation for other product candidates, there is no assurance that Synlogic will be the first to obtain marketing approval for any particular rare indication. Further, even though Synlogic has obtained orphan drug designation for its lead product candidate, or even if Synlogic obtains orphan drug designation for other potential product candidates, such designation may not effectively protect Synlogic from competition because different drugs can be approved for the same condition and the same drug can be approved for different conditions and potentially used off-label in the orphan indication. Even after an orphan drug is approved, the FDA can subsequently approve the same drug for the same condition for several reasons, including, if the FDA concludes that the later drug is safer or more effective or makes a major contribution to patient care. Orphan drug designation neither shortens the development time or regulatory review time of a drug, nor gives the drug any advantage in the regulatory review or approval process.

Product development involves a lengthy and expensive process with an uncertain outcome, and results of earlier pre-clinical studies and clinical trials may not be predictive of future clinical trial results.

The results from preclinical studies or early clinical trials of a product candidate may not predict the results that will be obtained in subsequent subjects or in later stage clinical trials of that product candidate or any other product candidate. Flaws in the design of a clinical trial may not become apparent until the clinical trial is well advanced. Synlogic has limited experience in designing clinical trials and it may be unable to design and execute

clinical trials to support regulatory approval of its product candidates. In addition, pre-clinical study and clinical trial data are often susceptible to varying interpretations and analyses. Product candidates that seemingly perform satisfactorily in pre-clinical studies and clinical trials may nonetheless fail to obtain regulatory approval. There is a high failure rate for drugs proceeding through clinical trials. A number of companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in clinical development even after achieving promising results in earlier studies, and any such setbacks in Synlogic's clinical development could negatively affect its business and operating results.

If Synlogic experiences delays or difficulties in the enrollment of patients in clinical trials, Synlogic's receipt of necessary regulatory approvals could be delayed or prevented.

Clinical trials of a new product candidate require the enrollment of a sufficient number of patients suffering from the disease or condition the product candidate is intended to treat and who meet other eligibility criteria. Rates of patient enrollment are affected by many factors, including the size of the potential patient population, the age and condition of the patients, the stage and severity of disease or condition, the nature and requirements of the protocol, the proximity of patients to clinical sites, the availability of effective treatments for the relevant disease or condition, the perceived risks, benefits and convenience of administration of the product candidate being studied, the patient referral practices of physicians, Synlogic's efforts to facilitate timely enrollment in clinical trials, and the eligibility criteria for the clinical trial. Delays or difficulties in patient enrollment or difficulties retaining trial participants, including as a result of the availability of existing or other investigational treatments, can result in increased costs, longer development times or termination of a clinical trial.

In addition, Synlogic's success may depend, in part, on its ability to identify patients who qualify for its clinical trials, or are likely to benefit from any product candidate that it may develop, which will require those potential patients to undergo a screening assay for the presence or absence of a particular genetic sequence or clinical trait. Genetically defined diseases generally, and especially those for which Synlogic's current product candidates are targeted, may have relatively low prevalence. For example, Synlogic estimates there are approximately 2,000 patients diagnosed with UCD in the United States, and approximately 16,500 patients that may be diagnosed with PKU in the United States. If Synlogic, or any third parties that Synlogic engages to assist it, are unable to successfully identify patients with these diseases, or experience delays in doing so, then Synlogic may not realize the full commercial potential of any product candidate it develops.

Synlogic may face potential product liability claims, and, if successful claims are brought against it, Synlogic may incur substantial liability and costs. If the use or misuse of Synlogic's product candidates harms patients, or is perceived to harm patients even when such harm is unrelated to its product candidates, Synlogic's regulatory approvals, if any, could be revoked or otherwise negatively impacted and Synlogic could be subject to costly and damaging product liability claims. If Synlogic is unable to obtain adequate insurance or is required to pay for liabilities resulting from a claim excluded from, or beyond the limits of, its insurance coverage, such liability could adversely affect Synlogic's financial condition.

The use or misuse of Synlogic's product candidates in clinical trials and the sale of any products for which Synlogic may obtain marketing approval exposes Synlogic to the risk of potential product liability claims. Product liability claims might be brought against Synlogic by consumers, healthcare providers, pharmaceutical companies or others selling or otherwise coming into contact with its product candidates and approved products, if any. There is a risk that Synlogic's product candidates may induce adverse events. If Synlogic cannot successfully defend against product liability claims, it could incur substantial liability and costs. Patients with the diseases targeted by Synlogic's product candidates may already be in severe and advanced stages of disease and have both known and unknown significant preexisting and potentially life-threatening health risks. During the course of treatment, patients may suffer adverse events, including death, for reasons that may be related to Synlogic's product candidates. Such events could subject Synlogic to costly litigation, require it to pay substantial amounts of money to injured patients, delay, negatively impact or end its opportunity to receive or maintain regulatory approval to market its products, or require Synlogic to suspend or abandon its

commercialization efforts. Even in a circumstance in which an adverse event is unrelated to Synlogic's product candidates, the investigation into the circumstance may be time-consuming or inconclusive. These investigations may delay Synlogic's regulatory approval process or impact and limit the type of regulatory approvals its product candidates receive or maintain. As a result of these factors, a product liability claim, even if successfully defended, could have a material adverse effect on Synlogic's business, financial condition or results of operations.

Although Synlogic has product liability insurance, which covers any clinical trial it may conduct in the United States, its insurance may be insufficient to reimburse it for any expenses or losses Synlogic may suffer. Synlogic will also likely be required to increase its product liability insurance coverage for the advanced clinical trials that it plans to initiate. If Synlogic obtains marketing approval for any of its product candidates, it will need to expand its insurance coverage to include the sale of commercial products. There is no way to know if Synlogic will be able to continue to obtain product liability coverage and obtain expanded coverage it may require, in sufficient amounts to protect it against losses due to liability, on acceptable terms, or at all. Synlogic may not have sufficient resources to pay for any liabilities resulting from a claim excluded from, or beyond the limits of, its insurance coverage. Where Synlogic has provided indemnities in favor of third parties under its agreements with them, there is also a risk that these third parties could incur liability and bring a claim under such indemnities. An individual may bring a product liability claim against Synlogic alleging that one of its product candidates or products causes, or is claimed to have caused, an injury or is found to be unsuitable for consumer use. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability, and a breach of warranties. Claims could also be asserted under state consumer protection acts. Any product liability claim brought against Synlogic, with or without merit, could result in:

- withdrawal of clinical trial volunteers, investigators, patients or trial sites or limitations on approved indications;
- the inability to commercialize, or if commercialized, decreased demand for, its product candidates;
- if commercialized, product recalls, withdrawals of labeling, marketing or promotional restrictions or the need for product modification;
- initiation of investigations by regulators;
- loss of revenues;
- substantial costs of litigation, including monetary awards to patients or other claimants;
- liabilities that substantially exceed Synlogic's product liability insurance, which Synlogic would then be required to pay itself;
- an increase in Synlogic's product liability insurance rates or the inability to maintain insurance coverage in the future on acceptable terms, if at all;
- the diversion of management's attention from Synlogic's business; and
- damage to Synlogic's reputation and the reputation of its products and its technology.

Product liability claims may subject Synlogic to the foregoing and other risks, which could have a material adverse effect on its business, financial condition or results of operations.

Risks Related to Regulatory Approval of Synlogic's Product Candidates and Other Legal Compliance Matters

Synlogic may seek breakthrough therapy designation for one or more of its product candidates, but it might not receive such designation, and even if Synlogic does, such designation may not lead to a faster development or regulatory review or approval process, and it does not increase the likelihood that Synlogic's product candidates will receive marketing approval.

Synlogic may seek a breakthrough therapy designation from the FDA for some of its product candidates. A breakthrough therapy is defined as a drug or biological product that is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening disease or condition, and for which preliminary clinical evidence indicates that the drug or biological product may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. For drugs or biological products that have been designated as breakthrough therapies, interaction and communication between the FDA and the sponsor of the trial can help to identify the most efficient path for clinical development while minimizing the number of patients placed in ineffective control regimens. Drugs designated as breakthrough therapies by the FDA could also be eligible for accelerated approval.

Designation as a breakthrough therapy is within the discretion of the FDA. Accordingly, even if Synlogic believes one of its product candidates meets the criteria for designation as a breakthrough therapy, the FDA may disagree and instead determine not to make such designation. In any event, the receipt of a breakthrough therapy designation for a product candidate may not result in a faster development process, review or approval compared to drugs considered for approval under conventional FDA procedures and does not assure ultimate approval by the FDA. In addition, even if one or more of Synlogic's product candidates qualify and are designated as breakthrough therapies, the FDA may later decide that the drugs or biological products no longer meet the conditions for designation and the designation may be rescinded.

Synlogic may seek Fast Track designation for one or more of its product candidates, but it might not receive such designation, and even if Synlogic does, such designation may not actually lead to a faster development or regulatory review or approval process.

If a product candidate is intended for the treatment of a serious condition and nonclinical or clinical data demonstrate the potential to address unmet medical need for the condition, a product sponsor may apply for FDA Fast Track designation. If Synlogic seeks Fast Track designation for one or more of its product candidates, Synlogic may not receive such designation. However, even if Synlogic receives Fast Track designation, Fast Track designation does not ensure that Synlogic will receive marketing approval for the product candidate or that approval will be granted within any particular timeframe. Synlogic may not experience a faster development or regulatory review or approval process with Fast Track designation compared to conventional FDA procedures. In addition, the FDA may withdraw Fast Track designation if it believes that the designation is no longer supported by data from Synlogic's clinical development program. Fast Track designation alone does not guarantee qualification for the FDA's priority review procedures.

Even if Synlogic obtains regulatory approval for a product candidate, Synlogic will remain subject to ongoing regulatory requirements.

If any of Synlogic's product candidates are approved for marketing, Synlogic will be subject to ongoing regulatory requirements, including with respect to manufacturing, labeling, packaging, storage, advertising, promotion, sampling, record-keeping, conduct of post-marketing clinical trials, and submission of safety, efficacy and other post-approval information, including both federal and state requirements in the United States and requirements of comparable foreign regulatory authorities.

Manufacturers and manufacturers' facilities are required to continuously comply with FDA and comparable foreign regulatory authority requirements, including ensuring that quality control and manufacturing procedures

conform to current Good Manufacturing Practices ("cGMP") regulations and corresponding foreign regulatory manufacturing requirements. As such, Synlogic and its contract manufacturers will be subject to continual review and inspections to assess compliance with cGMP and adherence to commitments made in any NDA or marketing authorization application.

Any regulatory approvals that Synlogic receives for its product candidates may be subject to limitations on the approved indicated uses for which the product candidate may be marketed or to the conditions of approval, or contain requirements for potentially costly post-marketing testing, including Phase 4 clinical trials, and surveillance to monitor the safety and efficacy of the product candidate. Synlogic will be required to report adverse reactions and production problems, if any, to the FDA and comparable foreign regulatory authorities. Any new legislation addressing drug safety issues could result in delays in product development or commercialization, or increased costs to assure compliance. If its original marketing approval for a product candidate was obtained through an accelerated approval pathway, Synlogic could be required to conduct a successful post-marketing clinical trial in order to confirm the clinical benefit for its products. An unsuccessful post-marketing clinical trial or failure to complete such a trial could result in the withdrawal of marketing approval.

If a regulatory agency discovers previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with the facility where the product is manufactured, or disagrees with the promotion, marketing or labeling of a product, the regulatory agency may impose restrictions on that product or Synlogic, including requiring withdrawal of the product from the market. If Synlogic fails to comply with applicable regulatory requirements, a regulatory agency or enforcement authority may, among other things:

- issue warning letters;
- impose civil or criminal penalties;
- suspend or withdraw regulatory approval;
- suspend any of Synlogic's ongoing clinical trials;
- refuse to approve pending applications or supplements to approved applications submitted by Synlogic;
- impose restrictions on Synlogic's operations, including closing its contract manufacturers' facilities; or
- require a product recall.

Any government investigation of alleged violations of law would be expected to require Synlogic to expend significant time and resources in response and could generate adverse publicity. Any failure to comply with ongoing regulatory requirements may significantly and adversely affect Synlogic's ability to develop and commercialize its products and the value of Synlogic and its operating results would be adversely affected.

Healthcare legislative reform measures may have a material adverse effect on Synlogic's business, financial condition or results of operations.

In the United States, there have been and continue to be a number of legislative initiatives to contain healthcare costs. For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act (collectively, the "ACA"), was passed, which was intended to substantially change the way health care is financed by both governmental health programs and private insurers, and significantly impact the U.S. pharmaceutical industry. The ACA, among other things, introduced a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted, or injected, increases the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and extends the rebate program to individuals enrolled in Medicaid managed care organizations, establishes annual fees and taxes on manufacturers of specified branded prescription drugs, and promotes a new Medicare Part D coverage gap discount program.

In January 2017, Congress voted to adopt a budget resolution for fiscal year 2017 that authorizes the implementation of legislation that would repeal portions of the ACA. Although such budget resolution is not a law, it is widely viewed as the first step toward the passage of legislation that would repeal certain aspects of the ACA. Further, on January 20, 2017, President Trump signed an Executive Order directing federal agencies with authorities and responsibilities under the ACA to waive, defer, grant exemptions from, or delay the implementation of any provision of the ACA that would impose a fiscal or regulatory burden on states, individuals, healthcare providers, health insurers, or manufacturers of pharmaceuticals or medical devices. As of June 2017, the House of Representatives has passed a new plan that would repeal and significantly alter many of the ACA's provisions if it were ever enacted, and the Senate is working on its own bill to accomplish the same goals. At this time, the immediate impact of the Executive Order and any of the legislation being considered by Congress is not clear. In addition, other legislative changes have been proposed or adopted since the ACA was enacted. These new laws may result in additional reductions in Medicare and other healthcare funding, which could have a material adverse effect on Synlogic's customers and, accordingly, its financial operations.

It is anticipated that the ACA, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and an additional downward pressure on the reimbursement Synlogic's customers may receive for its products. Further, there have been judicial and Congressional challenges to certain aspects of the ACA, and it is expected there will be additional challenges and amendments to the ACA in the future, especially with the recent change in administration. Any reduction in reimbursement from Medicare and other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent Synlogic from being able to generate revenue, attain profitability or commercialize its products.

Synlogic may be subject, directly or indirectly, to federal and state healthcare fraud and abuse laws, false claims laws, and health information privacy and security laws. If Synlogic is unable to comply, or has not fully complied, with such laws, it could face substantial penalties.

If Synlogic obtains FDA approval for any of its product candidates and begins commercializing those products in the United States, its operations may be subject to various federal and state fraud and abuse laws, including, without limitation, the federal Anti-Kickback Statute, the federal False Claims Act, and physician sunshine laws and regulations. These laws may impact, among other things, Synlogic's proposed sales, marketing, and education programs. In addition, Synlogic may be subject to patient privacy regulation by both the federal government and the states in which Synlogic conducts its business. The laws that may affect Synlogic's ability to operate include:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons from knowingly and willfully soliciting, receiving, offering or paying remuneration, directly or indirectly, to induce, or in return for, the purchase or recommendation of an item or service reimbursable under a federal healthcare program, such as the Medicare and Medicaid programs;
- federal civil and criminal false claims laws and civil monetary penalty laws, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, claims for payment from Medicare, Medicaid, or other third-party payors that are false or fraudulent;
- the federal Health Insurance Portability and Accountability Act of 1996 ("HIPAA"), which created new federal criminal statutes that prohibit executing a scheme to defraud any healthcare benefit program and making false statements relating to healthcare matters;
- HIPAA, as amended by the Health Information Technology and Clinical Health Act, and its implementing regulations, which imposes specified requirements relating to the privacy, security, and transmission of individually identifiable health information;
- the federal physician sunshine requirements under the ACA require manufacturers of drugs, devices, biologics, and medical supplies to report annually to the U.S. Department of Health and Human

Services information related to payments and other transfers of value to physicians, other healthcare providers, and teaching hospitals, and ownership and investment interests held by physicians and other healthcare providers and their immediate family members and applicable group purchasing organizations; and

- state law equivalents of each of the above federal laws, such as anti-kickback and false claims laws that may apply to items or services reimbursed by any third-party payor, including governmental and private payors, to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government, or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state laws that require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures, and state laws governing the privacy and security of health information in specified circumstances, many of which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts.

Because of the breadth of these laws and the narrowness of the statutory exceptions and safe harbors available, it is possible that some of Synlogic's business activities could be subject to challenge under one or more of such laws. In addition, recent health care reform legislation has strengthened these laws. For example, the ACA, among other things, amends the intent requirement of the federal anti-kickback and criminal healthcare fraud statutes. A person or entity no longer needs to have actual knowledge of this statute or specific intent to violate it. Moreover, the ACA provides that the government may assert that a claim including items or services resulting from a violation of the federal anti-kickback statute constitutes a false or fraudulent claim for purposes of the False Claims Act.

If Synlogic's operations are found to be in violation of any of the laws described above or any other governmental regulations that apply to Synlogic, Synlogic may be subject to penalties, including civil and criminal penalties, damages, fines, exclusion from participation in government health care programs, such as Medicare and Medicaid, imprisonment, and the curtailment or restructuring of its operations, any of which could adversely affect Synlogic's ability to operate its business and its results of operations.

If Synlogic fails to comply with environmental, health and safety laws and regulations, Synlogic could become subject to fines or penalties or incur costs that could have a material adverse effect on its business, financial condition or results of operations.

Synlogic's research and development activities and its third-party manufacturers' and suppliers' activities involve the controlled storage, use, and disposal of hazardous materials, including the components of its product candidates and other hazardous compounds. Synlogic and its manufacturers and suppliers are subject to laws and regulations governing the use, manufacture, storage, handling, and disposal of these hazardous materials. In some cases, these hazardous materials and various wastes resulting from their use are stored at Synlogic's and its manufacturers' facilities pending their use and disposal. Synlogic cannot eliminate the risk of contamination, which could cause an interruption of its research and development efforts, commercialization efforts and business operations and environmental damage resulting in costly clean-up and liabilities under applicable laws and regulations governing the use, storage, handling, and disposal of these materials and specified waste products. Although Synlogic believes that the safety procedures utilized by it and its third-party manufacturers for handling and disposing of these materials generally comply with the standards prescribed by these laws and regulations, Synlogic cannot guarantee that this is the case or eliminate the risk of accidental contamination or injury from these materials. In such an event, Synlogic may be held liable for any resulting damages and such liability could exceed its resources and state or federal or other applicable authorities may curtail Synlogic's use of specified materials and/or interrupt its business operations. Furthermore, environmental laws and regulations are complex, change frequently, and have tended to become more stringent. Synlogic cannot predict the impact of such changes and cannot be certain of its future compliance. Given the nature of the research and development work conducted by Synlogic, the company does not currently carry biological or hazardous waste insurance coverage.

Laws and regulations governing international operations may preclude Synlogic from developing, manufacturing and selling certain products outside of the United States and require Synlogic to develop, implement and maintain costly compliance programs.

To develop, manufacture and sell certain products outside the United States, Synlogic must dedicate resources to comply with numerous laws and regulations in each jurisdiction in which Synlogic operates. The Foreign Corrupt Practices Act ("FCPA"), prohibits any U.S. individual or business from paying, offering, authorizing payment or offering anything of value, directly or indirectly, to any foreign official, political party or candidate for the purpose of influencing any act or decision of the foreign entity in order to assist the individual or business in obtaining or retaining business. The FCPA also obligates companies whose securities are listed in the United States to comply with certain accounting provisions requiring the company to maintain books and records that accurately and fairly reflect all transactions of the corporation, including international subsidiaries, and to devise and maintain an adequate system of internal accounting controls for international operations.

Compliance with the FCPA is expensive and difficult, particularly in countries in which corruption is a recognized problem. In addition, the FCPA presents particular challenges in the pharmaceutical industry, because, in many countries, hospitals are operated by the government, and doctors and other hospital employees may be considered government employees or foreign officials. In other circumstances, certain payments to hospitals in connection with clinical trials and other work have been deemed to be improper payments to government officials and have led to FCPA enforcement actions.

Various laws, regulations and executive orders also restrict the use and dissemination outside of the United States, or the sharing with certain non-U.S. nationals, of information classified for national security purposes, as well as certain products and technical data relating to those products. These laws may preclude Synlogic from developing, manufacturing, or selling certain products and product candidates outside of the United States, which could limit Synlogic's growth potential and increase its development costs.

The failure to comply with laws governing international business practices may result in substantial civil and criminal penalties and suspension or debarment from government contracting. The SEC also may suspend or bar issuers from trading securities on U.S. exchanges for violations of the FCPA's accounting provisions and export control laws.

Synlogic's internal computer systems, or those of its collaborators or other contractors or consultants, may fail or suffer security breaches, which could result in a material disruption of Synlogic's product development programs.

Synlogic's internal computer systems and those of its current and any future collaborators and other contractors or consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. While Synlogic has not experienced any such material system failure, accident or security breach to date, if such an event were to occur and cause interruptions in its operations, it could result in a material disruption of Synlogic's development programs and its business operations, whether due to a loss of its trade secrets or other proprietary information or other similar disruptions. For example, the loss of pre-clinical or clinical trial data could result in delays in Synlogic's regulatory approval efforts and significantly increase its costs to recover or reproduce the data. To the extent that any disruption or security breach were to result in a loss of, or damage to, Synlogic's data or applications, or inappropriate disclosure of confidential or proprietary information, Synlogic could incur liability, its competitive position could be harmed and the further development and commercialization of its product candidates could be delayed.

Ethical, legal and social concerns about synthetic biology and genetic engineering could limit or prevent the use of Synlogic's technologies and limit its revenues.

Synlogic's technologies involve the use of synthetic biology and genetic engineering. Public perception about the safety and environmental hazards of, and ethical concerns over, synthetic biology and genetic

engineering could influence public acceptance of Synlogic's technologies, product candidates and processes. If Synlogic and its collaborators are not able to overcome the ethical, legal and social concerns relating to synthetic biology and genetic engineering, Synlogic's technologies, product candidates and processes may not be accepted. These concerns could result in increased expenses, regulatory scrutiny and increased regulation, trade restrictions on imports of Synthetic Biotic medicines, delays or other impediments to Synlogic's programs or the public acceptance and commercialization of Synthetic Biotic medicines. Further, there is a risk that Synthetic Biotic medicines made using Synlogic's technologies could result in adverse health effects or other adverse events, which could also lead to negative publicity. Synlogic designs and produces product candidates with characteristics comparable or disadvantaged to those found in naturally occurring organisms or enzymes in a controlled laboratory; however, the release of such organisms into uncontrolled environments could have unintended consequences. Any adverse effect resulting from such a release could have a material adverse effect on Synlogic's business, financial condition or results of operations and Synlogic may have exposure to liability for any resulting harm.

Risks Related to Synlogic's Intellectual Property

Synlogic may not be successful in obtaining or maintaining necessary rights to Synthetic Biotic targets, product candidates and processes for its development pipeline through acquisitions and in-licenses.

Presently, Synlogic has rights to certain intellectual property, through licenses from third parties and under patents and patent applications owned by Synlogic. The growth of Synlogic's business will likely depend in part on Synlogic's ability to obtain, maintain or enforce its and its licensors' intellectual property rights and also acquire or in-license additional proprietary rights. For example, Synlogic's programs may involve additional product candidates or delivery systems that may require the use of additional proprietary rights held by third parties. Synlogic's ultimate product candidates may also require specific formulations to work effectively and efficiently. These formulations may be covered by intellectual property rights held by others. Synlogic may be unable to acquire or in-license any relevant third-party intellectual property rights that Synlogic identifies as necessary or important to its business operations.

In addition, Synlogic's product candidates may require specific formulations to work effectively and efficiently and these rights may be held by other third parties. Synlogic may be unable to develop, acquire or in-license compositions, methods of use, processes or other third-party intellectual property rights from third parties that it identifies. The licensing and acquisition of third-party intellectual property rights is a competitive area, and a number of other companies may also be pursuing strategies to license or acquire third-party intellectual property rights that Synlogic may consider attractive. These companies could have a competitive advantage over Synlogic due to their size, cash resources and greater clinical development and commercialization capabilities.

For example, Synlogic has previously and may continue to collaborate with academic institutions to accelerate its pre-clinical research or development under written agreements with these institutions. Typically, these institutions provide an option to negotiate a license to any of the institution's rights in technology resulting from the collaboration. Regardless of such right of first negotiation for intellectual property, Synlogic may be unable to negotiate a license within the specified time frame or under terms that are acceptable to it. If Synlogic is unable to do so, the institution may offer the intellectual property rights to other parties, potentially blocking Synlogic's ability to pursue its program.

In addition, companies that perceive Synlogic to be a competitor may be unwilling to assign or license rights to it. Synlogic also may be unable to license or acquire third-party intellectual property rights on terms that would allow it to make an appropriate return on its investment. If Synlogic is unable to successfully obtain rights to third-party intellectual property rights, its business, financial condition and prospects for growth could suffer.

Synlogic intends to rely on patent rights and the status of its product candidates, if approved, as biologics eligible for exclusivity under the Biologics Price Competition and Innovation Act (BPCIA). If Synlogic is unable to obtain or maintain exclusivity from the combination of these approaches, Synlogic may not be able to compete effectively in its markets.

Synlogic relies or will rely upon a combination of patents, trade secret protection, and confidentiality agreements to protect the intellectual property related to its technologies and product candidates. Its success depends in large part on its and its licensors' ability to obtain regulatory exclusivity and maintain patent and other intellectual property protection in the United States and in other countries with respect to its proprietary technology and products.

Synlogic has sought to protect its proprietary position by filing patent applications in the United States and abroad related to its product candidates that are important to its business. This process is expensive and time consuming, and Synlogic may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that Synlogic will fail to identify patentable aspects of its research and development output before it is too late to obtain patent protection.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain and involves complex legal and factual questions for which legal principles remain unsolved. The patent applications that Synlogic owns or in-licenses may fail to result in issued patents with claims that cover its product candidates in the United States or in other foreign countries. There is no assurance that all potentially relevant prior art relating to Synlogic's patents and patent applications has been found, which can invalidate a patent or prevent a patent from issuing from a pending patent application. Even if patents do successfully issue, and even if such patents cover Synlogic's product candidates, third parties may challenge their validity, enforceability, or scope, which may result in such patents being narrowed, found unenforceable or invalidated. Furthermore, even if they are unchallenged, Synlogic's patents and patent applications may not adequately protect its intellectual property, provide exclusivity for its product candidates, or prevent others from designing around Synlogic's claims. Any of these outcomes could impair Synlogic's ability to prevent competition from third parties, which may have an adverse impact on its business.

Synlogic, independently or together with its licensors, has filed several patent applications covering various aspects of its product candidates. Synlogic cannot offer any assurances about which, if any, patents will issue, the breadth of any such patent or whether any issued patents will be found invalid and unenforceable or will be threatened by third parties. Any successful opposition to these patents or any other patents owned by or licensed to Synlogic after patent issuance could deprive Synlogic of rights necessary for the successful commercialization of any product candidates that Synlogic may develop. Further, if Synlogic encounters delays in regulatory approvals, the period of time during which Synlogic could market a product candidate under patent protection could be reduced.

Even if Synlogic cannot obtain and maintain effective protection of exclusivity from its regulatory efforts and intellectual property rights, including patent protection, data exclusivity or orphan drug exclusivity, for its product candidates, Synlogic believes that its product candidates will be protected by exclusivity that prevents approval of a biosimilar in the United States for a period of twelve years from the time the product to which it claims similarity was first approved. If a biosimilar version of one of Synlogic's product candidates were approved in the U.S., it could have a negative effect on Synlogic's business.

Synlogic may not have sufficient patent term protections for its product candidates to effectively protect its business.

Patents have a limited term. In the United States, the statutory expiration of a patent is generally 20 years after it is filed. Although various extensions may be available, the life of a patent, and the protection it affords, is limited. Even if patents covering Synlogic's product candidates are obtained, once the patent life has expired for

a product candidate, Synlogic may be open to competition from generic medications. In addition, upon issuance in the United States any patent term can be adjusted based on specified delays caused by the applicant(s) or the USPTO.

Patent term extensions under the Hatch-Waxman Act in the United States and under supplementary protection certificates in Europe may be available to extend the patent or data exclusivity terms of Synlogic's product candidates. Synlogic will likely seek patent term extensions, and Synlogic cannot provide any assurances that any such patent term extensions will be obtained and, if so, for how long. As a result, Synlogic may not be able to maintain exclusivity for its product candidates for an extended period after regulatory approval, if any, which would negatively impact its business, financial condition, results of operations and prospects. If Synlogic does not have sufficient patent terms or regulatory exclusivity to protect its product candidates, its business and results of operations will be adversely affected.

Changes in U.S. patent law could diminish the value of patents in general, thereby impairing Synlogic's ability to protect its products, and recent patent reform legislation could increase the uncertainties and costs surrounding the prosecution of its patent applications and the enforcement or defense of its issued patents.

As is the case with other biotechnology companies, Synlogic's success is heavily dependent on patents. Obtaining and enforcing patents in the biotechnology industry involves both technological and legal complexity, and is therefore costly, time-consuming and inherently uncertain. In addition, the United States has recently enacted and is currently implementing wide-ranging patent reform legislation. Recent U.S. Supreme Court rulings have narrowed the scope of patent protection available in specified circumstances and weakened the rights of patent owners in specified situations. In addition to increasing uncertainty with regard to Synlogic's ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken Synlogic's ability to obtain new patents or to enforce Synlogic's existing patents and patents that it might obtain in the future.

If Synlogic is unable to maintain effective proprietary rights for its product candidates or any future product candidates, Synlogic may not be able to compete effectively in its proposed markets.

In addition to the protection afforded by patents, Synlogic relies on trade secret protection and confidentiality agreements to protect proprietary know-how that is not patentable or that Synlogic elects not to patent. Synlogic also utilizes processes for which patents are difficult to enforce. In addition, other elements of Synlogic's products, and many elements of its product candidate discovery and development processes involve proprietary know-how, information or technology that is not covered by patents. Trade secrets may be difficult to protect. Synlogic seeks to protect its proprietary technology and processes, in part, by entering into confidentiality agreements with its employees, consultants, collaborators, advisors, independent contractors or other third parties. Synlogic also seeks to preserve the integrity and confidentiality of its data and trade secrets, including by maintaining physical and electronic security of its premises and its information technology systems. While Synlogic has confidence in these individuals, organizations and systems, agreements or security measures may be breached, and Synlogic may not have adequate remedies for any breach. In addition, competitors may otherwise gain access to Synlogic's trade secrets or independently develop substantially equivalent information and techniques. Furthermore, the laws of some foreign countries do not protect proprietary rights to the same extent or in the same manner as the laws of the United States. As a result, Synlogic may encounter significant problems in protecting and defending its intellectual property both in the United States and abroad. If Synlogic is unable to prevent unauthorized material disclosure of its intellectual property to third parties, or misappropriation of its intellectual property by third parties, it may not be able to establish or maintain a competitive advantage in its market, which could materially adversely affect its business, operating results, and financial condition.

Although Synlogic expects all of its employees and consultants to assign their inventions to Synlogic, and all of its employees, consultants, collaborators, advisors, independent contractors and any third parties who have

access to its proprietary know-how, information, or technology to enter into confidentiality agreements, Synlogic cannot provide any assurances that all such agreements have been duly executed or that its trade secrets and other confidential proprietary information will not be disclosed or that competitors will not otherwise gain access to its trade secrets or independently develop substantially equivalent information and techniques. Misappropriation or unauthorized disclosure of Synlogic's trade secrets could impair its competitive position and may have a material adverse effect on its business, financial condition or results of operations. Additionally, if the steps taken to maintain its trade secrets are deemed inadequate, Synlogic may have insufficient recourse against third parties for misappropriating the trade secret.

Third-party claims of intellectual property infringement may prevent or delay Synlogic's development and commercialization efforts.

Synlogic's commercial success depends in part on its ability to develop, manufacture, market and sell its product candidates and use its proprietary technology without infringing the patent rights of third parties. Numerous third-party U.S. and non-U.S. issued patents and pending applications exist in the area of Synthetic Biotics. Synlogic is aware of U.S. and foreign patents and pending patent applications owned by third parties that cover similar therapeutic uses as the product candidates Synlogic is developing. Synlogic is currently monitoring these patents and patent applications. Synlogic may in the future pursue available proceedings in the U.S. and foreign patent offices to challenge the validity of these patents and patent applications. In addition, or alternatively, Synlogic may consider whether to seek to negotiate a license of rights to technology covered by one or more of such patents and patent applications. If any patents or patent applications cover its product candidates or technologies, Synlogic may not be free to manufacture or market its product candidates as planned, absent such a license, which may not be available to Synlogic on commercially reasonable terms, or at all.

It is also possible that Synlogic has failed to identify relevant third-party patents or applications. For example, applications filed before November 29, 2000 and applications filed after that date that will not be filed outside the United States remain confidential until patents issue. Moreover, it is difficult for industry participants, including Synlogic, to identify all third-party patent rights that may be relevant to its product candidates and technologies because patent searching is imperfect due to differences in terminology among patents, incomplete databases and the difficulty in assessing the meaning of patent claims. Synlogic may fail to identify relevant patents or patent applications or may identify pending patent applications of potential interest but incorrectly predict the likelihood that such patents may issue with claims of relevance to its technology. In addition, Synlogic may be unaware of one or more issued patents that would be infringed by the manufacture, sale or use of a current or future product candidate, or Synlogic may incorrectly conclude that a third-party patent is invalid, unenforceable or not infringed by its activities. Additionally, pending patent applications that have been published can, subject to specified limitations, be later amended in a manner that could cover Synlogic's technologies, its product candidates or the use of its product candidates.

There have been many lawsuits and other proceedings filed by third parties involving patent and other intellectual property rights in the biotechnology and pharmaceutical industries, including patent infringement lawsuits, interferences, oppositions, and reexamination, post-grant review and equivalent proceedings before the USPTO and corresponding foreign patent offices. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which Synlogic is developing product candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that its product candidates may be subject to claims of infringement of the patent rights of third parties.

Parties making claims against Synlogic may obtain injunctive or other equitable relief, which could effectively block its ability to further develop and commercialize one or more of its product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from Synlogic's business. In the event of a successful claim of infringement against Synlogic, Synlogic may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, pay royalties, redesign its infringing products or obtain one or more licenses from third parties, which may be impossible or require substantial time and monetary expenditure.

Synlogic depends, in part, on its licensors to file, prosecute, maintain, defend and enforce patents and patent applications that are material to its business.

While Synlogic normally seeks and gains the right to fully prosecute the patent applications relating to its product candidates, there may be times when the patent applications enabling its product candidates are controlled by its licensors. If any of Synlogic's existing or future licensors fail to appropriately and broadly prosecute and maintain patent protection for patents covering any of its product candidates, its ability to develop and commercialize those product candidates may be adversely affected and Synlogic may not be able to prevent competitors from making, using, importing, and selling competing products. In addition, even where Synlogic now has the right to control patent prosecution of patents and patent applications Synlogic has licensed from third parties, Synlogic may still be adversely affected or prejudiced by actions or inactions of its licensors in effect from actions prior to Synlogic assuming control over patent prosecution.

If Synlogic fails to comply with obligations in the agreements under which Synlogic licenses intellectual property and other rights from third parties or otherwise experiences disruptions to its business relationships with its licensors, Synlogic could lose license rights that are important to its business.

Synlogic is a party to certain intellectual property license agreements that are important to its business and expects to enter into additional license agreements in the future. Synlogic's existing agreements impose, and Synlogic expects that future license agreements will impose, certain obligations, including the payment of milestones and royalties based on revenues from sales of its products utilizing the technologies licensed from its licensors, and such obligations could adversely affect the overall profitability for Synlogic of any products that it may seek to commercialize. In addition, Synlogic will need to outsource and rely on third parties for many aspects of the clinical development, sales and marketing of its product candidates covered under its license agreements. Delay or failure by these third parties could adversely affect the continuation of its license agreements with its third-party licensors. If Synlogic fails to comply with its obligations under these agreements, or Synlogic is subject to a bankruptcy, these agreements may be subject to termination by the licensor which could have a material adverse effect on Synlogic's business.

Synlogic may be involved in lawsuits to protect or enforce its patents or the patents of its licensors, which could be expensive, time consuming, and unsuccessful.

Competitors may infringe Synlogic's patents or the patents of its licensors. To cease such infringement or unauthorized use, Synlogic or one of its licensing partners may be required to file patent infringement claims against a third party to enforce one of its patents which can be expensive, time-consuming and unpredictable. In addition, in an infringement proceeding or a declaratory judgment action against Synlogic, a court may decide that one or more of Synlogic's patents is not valid or is unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that Synlogic's patents do not cover the technology in question. An adverse result in any litigation or defense proceeding could put one or more of Synlogic's patents at risk of being invalidated, held unenforceable or interpreted narrowly and could put its patent applications at risk of not issuing. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from Synlogic's business.

If Synlogic or one of its licensing partners were to initiate legal proceedings against a third party to enforce a patent covering one of Synlogic's product candidates, the defendant could counterclaim that the patent covering Synlogic's product candidate is invalid and/or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity and/or unenforceability are commonplace, and there are numerous grounds upon which a third party can assert invalidity or unenforceability of a patent. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, written description, clarity or non-enablement. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant information from the USPTO, or made a misleading statement, during prosecution. Third parties may also raise similar claims before administrative

bodies in the United States or other jurisdictions, even outside the context of litigation. Such mechanisms include re-examination, inter partes review, post-grant review and equivalent proceedings in foreign jurisdictions, such as opposition or derivation proceedings. Such proceedings could result in revocation or amendment to Synlogic's patents in such a way that they no longer cover and protect Synlogic's product candidates. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to the validity of Synlogic's patents, for example, Synlogic cannot be certain that there is no invalidating prior art of which Synlogic, its patent counsel, and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity, unpatentability and/or unenforceability, Synlogic may lose at least part, and perhaps all, of the patent protection on its product candidates. Such a loss of patent protection could have a material adverse impact on Synlogic's business.

Interference or derivation proceedings provoked by third parties or brought by Synlogic or declared by the USPTO may be necessary to determine the priority of inventions or correct inventorship with respect to Synlogic's patents or patent applications or those of its licensors. An unfavorable outcome could result in a loss of Synlogic current patent rights and could require Synlogic to cease using the related technology or to attempt to license rights to it from the prevailing party. Synlogic's business could be harmed if the prevailing party does not offer Synlogic a license on commercially reasonable terms. Synlogic's defense of litigation, derivation or interference proceedings may result in a decision adverse to Synlogic's interests and, even if successful, may result in substantial costs and distract its management and other employees. In addition, Synlogic may be unable to raise the funds necessary to conduct its clinical trials, continue its research programs, license necessary technology from third parties, or enter into development partnerships that would help Synlogic bring its product candidates to market.

Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of Synlogic's confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions, or other interim proceedings or developments. Any disclosure of confidential information could adversely affect Synlogic's business. If securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of Synlogic's common stock.

Synlogic may be subject to claims challenging the inventorship of its patents and other intellectual property.

Synlogic may in the future be subject to claims that former employees, consultants, collaborators, advisors, independent contractors or other third parties have an interest in its patents or other intellectual property as an inventor or co-inventor or other claims challenging the inventorship of its patents or ownership of its intellectual property (including patents and intellectual property that Synlogic in-licenses). Therefore, Synlogic's rights to these patents may not be exclusive and third parties, including competitors, may have access to intellectual property that is important to Synlogic's business. In addition, co-owners from whom Synlogic does not yet have a license or assignment may raise claims surrounding inventorship or ownership of patents that ultimately issue from this patent family, potentially resulting in issued patents to which Synlogic would not have rights under its existing license agreements. Further, in jurisdictions outside the United States, a license may not be enforceable unless all the owners of the intellectual property agree or consent to the license. In addition, Synlogic may have inventorship disputes arising from conflicting obligations of consultants or others who are involved in developing its product candidates. Litigation may be necessary to defend against these and other claims challenging inventorship of Synlogic's patents. If Synlogic fails in defending any such claims, in addition to paying monetary damages, Synlogic may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, valuable intellectual property. Such an outcome could have a material adverse effect on Synlogic's business. Even if Synlogic is successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

Synlogic may be subject to claims that its employees, consultants, collaborators, advisors, independent contractors or other third parties have wrongfully used or disclosed confidential information of third parties or that its employees have wrongfully used or disclosed alleged trade secrets of their former employers.

Synlogic has received confidential and proprietary information from third parties. In addition, Synlogic employs individuals who were previously employed at universities, academic research institutions and at other biotechnology or pharmaceutical companies, including Synlogic's competitors or potential competitors. Although Synlogic has written agreements with and makes every effort to ensure that its employees, consultants, collaborators, advisors, independent contractors or other third parties do not use the proprietary information or intellectual property rights of others in their work for Synlogic, Synlogic may in the future be subject to claims that its employees, consultants, collaborators, advisors, independent contractors or other third parties have inadvertently or intentionally used or disclosed confidential information of these third parties. Litigation may be necessary to defend against these claims. If Synlogic fails in defending any such claims, in addition to paying monetary damages, Synlogic may lose valuable intellectual property rights or personnel, which could adversely impact its business. Even if Synlogic is successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

Synlogic may not be able to protect its intellectual property rights throughout the world.

Synlogic has limited intellectual property rights outside the United States. Filing, prosecuting, and defending patents on product candidates in all countries throughout the world would be prohibitively expensive, and intellectual property rights in some countries outside the United States can have a different scope and strength and be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, Synlogic may not be able to prevent third parties (including competitors) from practicing its inventions in all countries outside the United States, or from selling or importing products made using Synlogic's inventions in and into the United States or other jurisdictions. Competitors may use Synlogic's technologies in jurisdictions where Synlogic has not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where Synlogic has patent protection, but where enforcement rights are not as strong as those in the United States. These products may compete with Synlogic's products and Synlogic's patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of some countries, particularly some developing countries, do not favor the enforcement of patents, trade secrets, and other intellectual property protection, particularly those relating to biopharmaceutical products, which could make it difficult in those jurisdictions for Synlogic to stop the infringement or misappropriation of its patents or other intellectual property rights, or the marketing of competing products in violation of Synlogic proprietary rights. Proceedings to enforce Synlogic's patents and other intellectual property rights in foreign jurisdictions, whether or not successful, could result in substantial costs and divert Synlogic's efforts and attention from other aspects of its business. Furthermore, such proceedings could put Synlogic's patents at risk of being invalidated, held unenforceable or interpreted narrowly and could put its patent applications at risk of not issuing and could provoke third parties to assert claims of infringement or misappropriation against Synlogic. Synlogic may not prevail in any lawsuits that it initiates and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, its efforts to enforce its intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that Synlogic develops or licenses.

If Synlogic's trademarks and trade names are not adequately protected, it may not be able to build name recognition in its markets of interest and its business may be adversely affected.

Synlogic has filed for trademark registration of certain marks relating to its current branding. If Synlogic's trademarks and trade names are not adequately protected, it may not be able to build name recognition in its

markets of interest and its business may be adversely affected. Synlogic's unregistered trademarks or trade names may be challenged, infringed, circumvented or declared generic or determined to be infringing on other marks. Synlogic may not be able to protect its rights to these trademarks and trade names, which it needs to build name recognition among potential partners or customers in its markets of interest. At times, competitors may adopt trade names or trademarks similar to Synlogic's, thereby impeding its ability to build brand identity and possibly leading to market confusion. In addition, there could be potential trade name or trademark infringement claims brought by owners of other registered trademarks or trademarks that incorporate variations of Synlogic's unregistered trademarks or trade names. Over the long term, if Synlogic is unable to successfully register its trademarks and trade names and establish name recognition based on its trademarks and trade names, then Synlogic may not be able to compete effectively and its business may be adversely affected. Synlogic's efforts to enforce or protect its proprietary rights related to trademarks, trade secrets, domain names, copyrights or other intellectual property may be ineffective and could result in substantial costs and diversion of resources and could adversely impact its financial condition or results of operations.

Risks Related to Synlogic's Reliance on Third Parties

Synlogic relies, and expects to continue to rely, on third parties to conduct some aspects of its compound formulation, research, preclinical, and clinical studies, and those third parties may not perform satisfactorily, including by failing to meet deadlines for the completion of such formulation, research or testing.

Synlogic does not independently conduct all aspects of its drug discovery activities, compound formulation research or preclinical studies of product candidates. Synlogic currently relies, and expects to continue to rely, on third parties to conduct some aspects of its research and development and preclinical studies. Any of these third parties may terminate their engagements with Synlogic at any time. If Synlogic needs to enter into alternative arrangements, it would delay Synlogic's product development activities. Synlogic's reliance on these third parties for research and development activities reduces its control over these activities but does not relieve Synlogic of its responsibilities. For example, for product candidates that Synlogic develops and commercializes on its own, Synlogic will remain responsible for ensuring that each of its studies that support its clinical trial applications and its clinical trials are conducted in accordance with the study plan and protocols for the trial. If these third parties do not successfully carry out their contractual duties, meet expected deadlines or conduct Synlogic's studies in accordance with regulatory requirements or its stated study plans and protocols, Synlogic will not be able to complete, or may be delayed in completing, the necessary preclinical studies to enable Synlogic or its strategic alliance partners to select viable product candidates for clinical trial application submissions and will not be able to, or may be delayed in its efforts to, successfully develop and commercialize such product candidates.

Synlogic relies on third-party supply and manufacturing partners for drug supplies for its research and development, preclinical activities, and clinical activities, and may do the same for any commercial supplies of its product candidates.

Synlogic relies on third-party supply and manufacturing partners to supply the materials and components for, and manufacture, a portion of its research and development and preclinical study drug supplies and may do the same for any clinical trial drug supplies. Synlogic has not yet manufactured or formulated any product candidate on a commercial scale and may not be able to do so for any of its product candidates. Synlogic will work to develop and optimize its manufacturing process, and Synlogic cannot be sure that the process will result in therapies that are safe, potent or effective.

Synlogic does not own manufacturing facilities or supply sources for such components and materials, but may develop these capabilities in the future. There can be no assurance that Synlogic's supply of research and development, preclinical and clinical development drugs and other materials will not be limited, interrupted, restricted in certain geographic regions or of satisfactory quality or continue to be available at acceptable prices. In particular, any replacement of any product formulation manufacturer Synlogic may engage could require significant effort and expertise because there may be a limited number of qualified replacements.

The manufacturing process for a product candidate is subject to FDA and foreign regulatory authority review. Suppliers and manufacturers must meet applicable manufacturing requirements and undergo rigorous facility and process validation tests required by regulatory authorities in order to comply with regulatory standards, such as cGMP regulations. In the event that any of Synlogic's suppliers or manufacturers fails to comply with such requirements or to perform its obligations to Synlogic in relation to quality, timing or otherwise, or if Synlogic's supply of components or other materials becomes limited or interrupted for other reasons, Synlogic may be forced to manufacture the materials itself, for which Synlogic currently does not have the capabilities or resources, or enter into an agreement with another third party, which Synlogic may not be able to do on reasonable terms, if at all. In some cases, the technical skills or technology required to manufacture Synlogic's product candidates may be unique or proprietary to the original manufacturer and Synlogic may have difficulty, or there may be contractual restrictions prohibiting Synlogic from, transferring such skills or technology to another third party and a feasible alternative may not exist. These factors would increase Synlogic's reliance on such manufacturer or require Synlogic to obtain a license from such manufacturer in order to have another third party manufacture its product candidates. If Synlogic is required to change manufacturers for any reason, it will be required to verify that the new manufacturer maintains facilities and procedures that comply with quality standards and with all applicable regulations and guidelines. The delays associated with the verification of a new manufacturer could negatively affect Synlogic's ability to develop product candidates in a timely manner or within budget.

Synlogic may rely on third party manufacturers if it receives regulatory approval for any product candidate. To the extent that Synlogic has existing, or enters into future, manufacturing arrangements with third parties, it will depend on these third parties to perform their obligations in a timely manner consistent with contractual and regulatory requirements, including those related to quality control and assurance. If Synlogic is unable to obtain or maintain third-party manufacturing for product candidates, or to do so on commercially reasonable terms, Synlogic may not be able to develop and commercialize its product candidates successfully. Synlogic's or a third party's failure to execute on Synlogic's manufacturing requirements could adversely affect Synlogic's business in a number of ways, including:

- an inability to initiate or continue clinical trials of product candidates under development;
- delay in submitting regulatory applications, or receiving regulatory approvals, for product candidates;
- loss of the cooperation of a collaborator;
- subjecting Synlogic's product candidates to additional inspections by regulatory authorities;
- requirements to cease distribution or to recall batches of Synlogic's product candidates; and
- in the event of approval to market and commercialize a product candidate, an inability to meet commercial demands for Synlogic's products.

Synlogic enters into various contracts in the normal course of its business in which Synlogic indemnifies the other party to the contract. In the event Synlogic has to perform under these indemnification provisions, it could have a material adverse effect on its business, financial condition and results of operations.

In the normal course of business, Synlogic periodically enters into academic, commercial, service, collaboration, licensing, consulting and other agreements that contain indemnification provisions. With respect to Synlogic's academic and other research agreements, Synlogic typically indemnifies the institution and related parties from losses arising from claims relating to the products, processes or services made, used, sold or performed pursuant to the agreements for which Synlogic has secured licenses, and from claims arising from Synlogic's or its sublicensees' exercise of rights under the agreement. With respect to Synlogic's collaboration agreements, Synlogic indemnifies its collaborators from any third-party product liability claims that could result from the production, use or consumption of the product, as well as for alleged infringements of any patent or other intellectual property right by a third party. With respect to consulting agreements, Synlogic indemnifies consultants from claims arising from the good faith performance of their services.

Should Synlogic's obligation under an indemnification provision exceed applicable insurance coverage or should Synlogic be denied insurance coverage, Synlogic's business, financial condition and results of operations could be adversely affected. Similarly, if Synlogic is relying on a collaborator to indemnify Synlogic and the collaborator is denied insurance coverage or the indemnification obligation exceeds the applicable insurance coverage, and if the collaborator does not have other assets available to indemnify Synlogic, its business, financial condition and results of operations could be adversely affected.

To the extent Synlogic is able to enter into collaborative arrangements or strategic alliances, Synlogic may be exposed to risks related to those collaborations and alliances.

Synlogic is currently party to an agreement with AbbVie. Biotechnology companies sometimes become dependent upon collaborative arrangements or strategic alliances to complete the development and commercialization of product candidates. If Synlogic elects to enter into collaborative arrangements or strategic alliances, these arrangements may place the development of its product candidates outside its control, may require it to relinquish important rights or may otherwise be on terms unfavorable to it.

Dependence on collaborative arrangements or strategic alliances would subject Synlogic to a number of risks, including the risk that:

- Synlogic may not be able to control the amount and timing of resources that its collaborators may devote to the relevant product candidates;
- Synlogic's collaborators may experience financial difficulties;
- Synlogic may be required to relinquish important rights, such as marketing and distribution rights;
- business combinations or significant changes in a collaborator's business strategy may also adversely affect a collaborator's willingness or ability to complete its obligations under any arrangement;
- a collaborator could independently move forward with a competing drug candidate developed either independently or in collaboration with others, including Synlogic's competitors; and
- collaborative arrangements are often terminated or allowed to expire, which would delay the development and may increase the cost of developing Synlogic's drug candidates.

Synlogic may attempt to form collaborations in the future with respect to its product candidates, but it may not be able to do so, which may cause it to alter its development and commercialization plans.

Synlogic may attempt to form strategic collaborations, create joint ventures or enter into licensing arrangements with third parties with respect to its programs or platform that it believes will complement or augment its existing business. Synlogic may face significant competition in seeking appropriate strategic collaborators, and the negotiation process to secure appropriate terms is time consuming and complex. Synlogic may not be successful in its efforts to establish such a strategic collaboration for any product candidates and programs on terms that are acceptable to it, or at all. This may be because Synlogic's product candidates and programs may be deemed to be at too early of a stage of development for collaborative effort, its research and development pipeline may be viewed as insufficient, the competitive or intellectual property landscape may be viewed as too intense or risky, and/or third parties may not view its product candidates and programs as having sufficient potential for commercialization, including the likelihood of an adequate safety and efficacy profile.

Any delays in identifying suitable collaborators and entering into agreements to develop and/or commercialize Synlogic's product candidates could delay the development or commercialization of Synlogic's product candidates, which may reduce their competitiveness even if they reach the market. Absent a strategic collaborator, Synlogic would need to undertake development and/or commercialization activities at its own expense. If Synlogic elects to fund and undertake development and/or commercialization activities on its own, it may need to obtain additional expertise and additional capital, which may not be available to it on acceptable terms or at all. If Synlogic is unable to do so, it may not be able to develop its product candidates or bring them to market and its business may be materially and adversely affected.

If Synlogic commits certain material breaches under its agreement with the Gates Foundation, and fails to cure them, the Gates Foundation may exercise a right to obtain a license to certain of Synlogic's intellectual property or require Synlogic to redeem shares of Synlogic Capital Stock held by the Gates Foundation and its affiliates.

In September 2014, Synlogic entered into a letter agreement with the Bill & Melinda Gates Foundation (the "Gates Foundation"). In connection with the agreement, the Gates Foundation purchased $1.0 million of Series A-1 preferred stock, $1.4 million of Series A-2 preferred stock and $2.6 million of Class A-3 preferred units, and Synlogic committed to use a portion of the investment by the Gates Foundation to generally develop its Synthetic Biotic platform for potential use in neglected diseases prioritized by the Gates Foundation. In the event the Gates Foundation terminates the agreement for certain specified uncured material breaches by Synlogic, Synlogic will be obligated, among other remedies, to redeem the securities purchased by the Gates Foundation or to facilitate the purchase of such securities by a third party (in certain circumstances, Synlogic may instead satisfy such obligation by registering the resale of the securities into the public markets or through the ability of the Gates Foundation to resell the securities without volume limitations in reliance on Rule 144 under the Securities Act), and/or the Gates Foundation may exercise its right to obtain a non-exclusive license to certain of Synlogic's intellectual property for use in certain prioritized diseases in developing countries. Additionally, in the six months following such sale or redemption, if Synlogic engages in certain specified corporate transactions that would value the sold or redeemed shares at more than 200% of the valuation used for the sale or redemption, Synlogic will be required to compensate the Gates Foundation for the difference between what the Gates Foundation would have received and what it actually received under the sale or redemption. If Synlogic instead elects to register the resale of the securities into the public markets or the Gates Foundation resells the securities in reliance on Rule 144, Synlogic will be required to compensate the Gates Foundation for the difference between what the Gates Foundation initially invested and what it actually received under such resale if there is any shortfall. If Synlogic is required to redeem such shares or to compensate the Gates Foundation following a specified corporate transaction or a resale, Synlogic's financial condition could be materially and adversely affected. If the Gates Foundation exercises its right to obtain a non-exclusive license and develops and commercializes product candidates and products that Synlogic is also developing and commercializing, such exercise could have an adverse impact on Synlogic's market position.

Risks Related to Commercialization of Synlogic's Product Candidates

If any of Synlogic's product candidates are approved for marketing and commercialization and it is unable to develop sales, marketing and distribution capabilities on its own or enter into agreements with third parties to perform these functions on acceptable terms, Synlogic will be unable to successfully commercialize any such future products.

Synlogic currently has no sales, marketing or distribution capabilities or experience. If any of Synlogic's product candidates is approved for marketing and commercialization, Synlogic will need to develop internal sales, marketing and distribution capabilities to commercialize such products, which would be expensive and time-consuming, or enter into collaborations with third parties to perform these services. If Synlogic decides to market its products directly, Synlogic will need to commit significant financial and managerial resources to develop a marketing and sales force with technical expertise and supporting distribution, administration and compliance capabilities. If Synlogic relies on third parties with such capabilities to market its products or decides to co-promote products with collaborators, Synlogic will need to establish and maintain marketing and distribution arrangements with third parties, and there can be no assurance that Synlogic will be able to enter into such arrangements on acceptable terms or at all. In entering into third-party marketing or distribution arrangements, any revenue Synlogic receives will depend upon the efforts of third parties and there can be no assurance that such third parties will establish adequate sales and distribution capabilities or be successful in gaining market acceptance of any approved product. If Synlogic is not successful in commercializing any product approved for marketing and commercialization in the future, either on its own or through third parties, Synlogic's business, financial condition, results of operations and prospects may be adversely affected.

If the market opportunities for its product candidates are smaller than Synlogic believes they are, Synlogic may not meet its revenue expectations and, assuming approval of a product candidate, its business may suffer. Because the patient populations in the market for its product candidates may be small, Synlogic must be able to successfully identify patients and acquire a significant market share to achieve profitability and growth.

Given the small number of patients who have the diseases that Synlogic is targeting, its eligible patient population and pricing estimates may differ significantly from the actual market addressable by its product candidates. Synlogic's projections of both the number of people who have applicable diseases, as well as the subset of people with these diseases who have the potential to benefit from treatment with its product candidates, are based on its beliefs and estimates. These estimates have been derived from a variety of sources, including scientific literature, patient foundations, or market research, and may prove to be incorrect. Further, new studies may change the estimated incidence or prevalence of these diseases. The number of patients may turn out to be lower than expected. The potentially addressable patient population for each of its product candidates may be limited or may not be amenable to treatment with its product candidates, and new patients may become increasingly difficult to identify or gain access to, which would adversely affect Synlogic's business, financial condition, results of operations and prospects.

Synlogic faces substantial competition and its competitors may discover, develop or commercialize products faster or more successfully than Synlogic.

The development and commercialization of new products is highly competitive. Synlogic faces competition from major pharmaceutical companies, specialty pharmaceutical companies, biotechnology companies, universities and other research institutions worldwide with respect to its product candidates that it may seek to develop or commercialize in the future. For example, Horizon Pharma plc, Dimension Therapeutics, Inc., Aeglea Biotherapeutics, Inc., Arcturus Therapeutics Inc., Castle Creek Pharma LLC, PhaseRx, Inc., Rana Therapeutics and Selecta Biosciences, Inc. have developed or are developing product candidates for the treatment of UCD; Valeant Pharmaceuticals International, Inc., Ocera Therapeutics, Inc., Umecrine Cognition AB, Salix Pharmaceuticals, Ltd, as well as other preclinical and discovery stage companies have developed or are each developing product candidates for the treatment of HE; and BioMarin, Inc., MipSalus ApS, Codexis, Inc., Dimension Therapeutics, Inc. and Synthetic Biologics, Inc. have developed or are developing product candidates for the treatment of PKU. Synlogic's competitors may succeed in developing, acquiring or licensing technologies and products that are more effective or less costly than the product candidates that Synlogic is currently developing or that it may develop, which could render Synlogic's product candidates obsolete and noncompetitive.

In addition to the competition Synlogic faces from alternative therapies for the diseases it intends to target with its product candidates, Synlogic is also aware of several companies that are also working specifically to develop engineered bacteria as cellular drug therapies, such as Intrexon Corp. Further there are several companies working to develop other similar products. Many of Synlogic's competitors have substantially greater financial, technical and other resources, such as larger research and development staff and experienced marketing and manufacturing organizations. Third-party payors, including governmental and private insurers, may also encourage the use of generic products.

If Synlogic's competitors obtain marketing approval from the FDA or comparable foreign regulatory authorities for their product candidates more rapidly than Synlogic, it could result in its competitors establishing a strong market position before Synlogic is able to enter the market.

Many of Synlogic's competitors have materially greater name recognition and financial, manufacturing, marketing, research and drug development resources than it does. Additional mergers and acquisitions in the biotechnology and pharmaceutical industries may result in even more resources being concentrated in Synlogic's competitors. Large pharmaceutical companies in particular have extensive expertise in pre-clinical and clinical testing and in obtaining regulatory approvals for drugs. In addition, academic institutions, government agencies,

and other public and private organizations conducting research may seek patent protection with respect to potentially competitive products or technologies. These organizations may also establish exclusive collaborative or licensing relationships with Synlogic's competitors. Failure of Synlogic's product candidates to effectively compete against established treatment options or in the future with new products currently in development would harm Synlogic's business, financial condition, results of operations and prospects.

The commercial success of any of Synlogic's current or future product candidates will depend upon the degree of market acceptance by physicians, patients, third-party payors, and others in the medical community.

Even with approvals from the FDA and comparable foreign regulatory authorities, the commercial success of Synlogic's products will depend in part on the health care providers, patients, and third-party payors accepting Synlogic's product candidates as medically useful, cost-effective, and safe. Any product that Synlogic brings to the market may not gain market acceptance by physicians, patients and third-party payors. The degree of market acceptance of any of Synlogic's products will depend on a number of factors, including but not limited to:

- the efficacy of the product as demonstrated in clinical trials and potential advantages over competing treatments;
- the safety and side effect profile of the product as demonstrated in clinical trials and potential advantages over competing treatments;
- the prevalence and severity of the disease targeted;
- the clinical indications for which approval is granted, including any limitations or warnings contained in a product's approved labeling;
- the convenience and ease of administration;
- the cost of treatment;
- the willingness of the patients and physicians to accept these therapies;
- the perceived ratio of risk and benefit of these therapies by physicians, patients, and payers, and the willingness of physicians to recommend these therapies to patients based on such risks and benefits;
- the marketing, sales and distribution support for the product;
- the publicity concerning the products or competing products and treatments; and
- the pricing and availability of third-party insurance coverage and reimbursement.

Even if a product displays a favorable efficacy and safety profile upon approval, market acceptance of the product remains uncertain. Efforts to educate the medical community and third-party payors on the benefits of the products may require significant investment and resources and may never be successful. If its products fail to achieve an adequate level of acceptance by physicians, patients, third-party payors, and other health care providers, Synlogic will not be able to generate sufficient revenue to become or remain profitable.

Synlogic may not be successful in any efforts to identify, license, discover, develop, or commercialize additional product candidates.

Although a substantial amount of Synlogic's effort will focus on the clinical testing, potential approval, and commercialization of its existing product candidates, the success of Synlogic's business is also expected to depend in part upon its ability to identify, license, discover, develop, or commercialize additional product candidates. Research programs to identify new product candidates require substantial technical, financial, and human resources. Synlogic may focus its efforts and resources on potential programs or product candidates that ultimately prove to be unsuccessful. Synlogic's research programs or licensing efforts may fail to yield additional

product candidates for clinical development and commercialization for a number of reasons, including but not limited to the following:

- Synlogic's research or business development methodology or search criteria and process may be unsuccessful in identifying potential product candidates;
- Synlogic may not be able or willing to assemble sufficient resources to acquire or discover additional product candidates;
- Synlogic's product candidates may not succeed in pre-clinical or clinical testing;
- Synlogic's potential product candidates may be shown to have harmful side effects or may have other characteristics that may make the products unmarketable or unlikely to receive marketing approval;
- competitors may develop alternatives that render Synlogic's product candidates obsolete or less attractive;
- product candidates Synlogic develops may be covered by third parties' patents or other exclusive rights;
- the market for a product candidate may change during development or commercialization so that such a product may become unreasonable to continue to develop or commercialize;
- a product candidate may not be capable of being produced in commercial quantities at an acceptable cost, or at all; and
- a product candidate may not be accepted as safe and effective by patients, the medical community, or third-party payors.

If any of these events occur, Synlogic may be forced to abandon its development efforts for one or more product candidates, or Synlogic may not be able to identify, license, discover, develop, or commercialize additional product candidates, which would have a material adverse effect on its business, financial condition or results of operations and could potentially cause Synlogic to cease operations.

Failure to obtain or maintain adequate reimbursement or insurance coverage for products, if any, could limit Synlogic's ability to market those products and decrease its ability to generate revenue.

The pricing, coverage, and reimbursement of Synlogic's approved products, if any, must be sufficient to support its commercial efforts and other development programs and the availability and adequacy of coverage and reimbursement by third-party payors, including governmental and private insurers, are essential for most patients to be able to afford expensive treatments. Sales of Synlogic's approved products, if any, will depend substantially, both domestically and abroad, on the extent to which the costs of its approved products, if any, will be paid for or reimbursed by health maintenance, managed care, pharmacy benefit and similar healthcare management organizations, or government payors and private payors. If coverage and reimbursement are not available, or are available only in limited amounts, Synlogic may have to subsidize or provide products for free or Synlogic may not be able to successfully commercialize its products.

In addition, there is significant uncertainty related to the insurance coverage and reimbursement for newly approved products. In the United States, the principal decisions about coverage and reimbursement for new drugs are typically made by the Centers for Medicare & Medicaid Services ("CMS"), an agency within the U.S. Department of Health and Human Services, as CMS decides whether and to what extent a new drug will be covered and reimbursed under Medicare. Private payors tend to follow the coverage reimbursement policies established by CMS to a substantial degree. It is difficult to predict what CMS will decide with respect to reimbursement for novel product candidates such as Synlogic's and what reimbursement codes its product candidates may receive if approved.

Outside the United States, international operations are generally subject to extensive governmental price controls and other price-restrictive regulations, and Synlogic believes the increasing emphasis on cost-

containment initiatives in Europe, Canada, and other countries has and will continue to put pressure on the pricing and usage of products. In many countries, the prices of products are subject to varying price control mechanisms as part of national health systems. Price controls or other changes in pricing regulation could restrict the amount that Synlogic is able to charge for its products, if any. Accordingly, in markets outside the United States, the potential revenue from the sale of Synlogic's products may be insufficient to generate commercially reasonable revenue and profits.

Moreover, increasing efforts by governmental and private payors in the United States and abroad to limit or reduce healthcare costs may result in restrictions on coverage and the level of reimbursement for new products and, as a result, they may not cover or provide adequate payment for its products. Synlogic expects to experience pricing pressures in connection with products due to the increasing trend toward managed healthcare, including the increasing influence of health maintenance organizations and additional legislative changes. The downward pressure on healthcare costs in general, particularly prescription drugs has and is expected to continue to increase in the future. As a result, profitability of Synlogic's products, if any, may be more difficult to achieve even if they receive regulatory approval.

Risks Related to Synlogic's Business Operations and Employees

Synlogic's failure to attract and retain senior management and key scientific personnel may prevent it from successfully developing its product candidates or any future product candidate, conducting its clinical trials and commercializing any products.

Synlogic's success depends in part on its continued ability to attract, retain and motivate highly qualified management, clinical and scientific personnel. Synlogic believes that its future success is highly dependent upon the contributions of its senior management, particularly its president and chief executive officer, chief financial officer, chief medical officer, as well as its senior scientists and other members of its senior management team. The loss of services of any of these individuals could delay or prevent the successful development of Synlogic's product pipeline, completion of Synlogic's planned clinical trials or the commercialization of the products Synlogic develops.

Although Synlogic has not historically experienced significant difficulties attracting and retaining qualified employees, it could experience such problems in the future. For example, competition for qualified personnel in the biotechnology and pharmaceuticals field is intense due to the limited number of individuals who possess the skills and experience required by Synlogic's industry. Synlogic will need to hire additional personnel as it expands its clinical development and commercial activities. Synlogic may not be able to attract and retain quality personnel on acceptable terms, or at all.

Synlogic's employees, independent contractors, principal investigators, CROs, consultants and collaborators may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements and insider trading.

Synlogic is exposed to the risk that its employees, independent contractors, consultants and collaborators may engage in fraudulent conduct or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or unauthorized activities that violate: (1) regulations of regulatory authorities in jurisdictions where Synlogic is performing activities in relation to its product candidates, including those laws requiring the reporting of true, complete and accurate information to such authorities; (2) manufacturing regulations and standards; (3) fraud and abuse and anti-corruption laws and regulations; or (4) laws that require the reporting of true and accurate financial information and data. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, bias, misconduct, kickbacks, self-dealing and other abusive practices, and these laws may differ substantially from country to country. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements.

These activities also include the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to Synlogic's reputation. It is not always possible to identify and deter misconduct by employees and other third parties, and the precautions Synlogic takes to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting itself from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. If any such actions are instituted against Synlogic, and Synlogic is not successful in defending itself or asserting its rights, those actions could have a significant impact on Synlogic's business including the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, possible exclusion from participation in subsidized healthcare programs in a given country, contractual damages, reputational harm, diminished profits and future earnings, and curtailment of its operations, any of which could adversely affect Synlogic's ability to operate its business and its results of operations.

Risks Related to the Combined Organization

In determining whether you should approve the Merger, the issuance of shares of Mirna Common Stock and other matters related to the Merger, as the case *may be, you should carefully read the following risk factors in addition to the risks described under "Risk Factors—Risks Related to the Merger," "Risk Factors—Risks Related to Mirna" and "Risk Factors—Risks Related to Synlogic," which will also apply to the combined organization.*

Mirna's stock price is expected to be volatile, and the market price of Mirna Common Stock may drop following the Merger.

The market price of Mirna Common Stock following the Merger could be subject to significant fluctuations. Market prices for securities of early-stage pharmaceutical, biotechnology, and other life sciences companies have historically been particularly volatile. Some of the factors that may cause the market price of Mirna Common Stock to fluctuate following the Merger include:

- the ability of the combined organization to obtain regulatory approvals for product candidates, and delays or failures to obtain such approvals;
- the failure of any of the combined organization's product candidates, if approved for marketing and commercialization, to achieve commercial success;
- issues in manufacturing the combined organization's approved products, if any, or product candidates;
- the results of current, and any future, preclinical or clinical trials of the combined organization's product candidates;
- the entry into, or termination of, key agreements, including key licensing or collaboration agreements;
- the initiation of material developments in, or conclusion of, litigation to enforce or defend any of the combined organization's intellectual property rights or defend against the intellectual property rights of others;
- announcements by commercial partners or competitors of new commercial products, clinical progress (or the lack thereof), significant contracts, commercial relationships, or capital commitments;
- adverse publicity relating to the combined organization's markets, including with respect to other products and potential products in such markets;
- the introduction of technological innovations or new therapies competing with potential products of the combined organization;
- the loss of key employees;
- changes in estimates or recommendations by securities analysts, if any, who cover the Mirna Common Stock;

- general and industry-specific economic conditions potentially affecting the combined organization's research and development expenditures;
- changes in the structure of health care payment systems;
- period-to-period fluctuations in the combined organization's financial results;
- failure to meet or exceed financial and development projections the combined organization may provide to the public;
- failure to meet or exceed the financial and development projections of the investment community;
- the perception of the pharmaceutical industry by the public, legislators, regulators, and the investment community;
- adverse regulatory decisions;
- disputes or other developments relating to proprietary rights, including patents, litigation matters, and the combined organization's ability to obtain patent protection for its technologies;
- sales of the Mirna Common Stock by the combined organization or its stockholders in the future;
- trading volume of the Mirna Common Stock; and
- period-to-period fluctuations in the combined organization's financial results.

Moreover, the stock markets in general have experienced substantial volatility that has often been unrelated to the operating performance of individual companies or the biotechnology sector. These broad market fluctuations may also adversely affect the trading price of the combined organization's common stock.

In the past, following periods of volatility in the market price of a company's securities, stockholders have often instituted class action securities litigation against those companies. Such litigation, if instituted, could result in substantial costs and diversion of management's attention and resources, which could significantly harm the combined organization's profitability and reputation.

The combined organization will incur increased costs and demands upon management as a result of complying with the laws and regulations affecting public companies, which could harm the combined organization's operating results.

The combined organization will incur significant legal, accounting and other expenses, including costs associated with public company reporting requirements. The combined organization will also incur costs associated with complying with current corporate governance requirements, including requirements under Section 404 and other provisions of the Sarbanes-Oxley Act, as well as rules implemented by the SEC or NASDAQ or any other stock exchange or inter-dealer quotations system on which the Mirna Common Stock may be listed in the future. The expenses incurred by public companies for reporting and corporate governance purposes have increased dramatically in recent years. Synlogic expects that these rules and regulations will substantially increase Synlogic's legal and financial compliance costs and to make some activities more time-consuming and costly. Synlogic is unable currently to estimate these costs with any degree of certainty. Synlogic also expects that these new rules and regulations may make it difficult and expensive for the combined organization to obtain director and officer liability insurance, and if the combined organization is able to obtain such insurance, it may be required to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage available to privately-held companies. As a result, it may be more difficult for the combined organization to attract and retain qualified individuals to serve on its board of directors or as its executive officers.

Anti-takeover provisions in the combined organization's charter documents and under Delaware law could make an acquisition of the combined organization more difficult and may prevent attempts by the combined organization's stockholders to replace or remove the combined organization's management.

Provisions in the combined organization's certificate of incorporation and bylaws may delay or prevent an acquisition or a change in management. These provisions include a classified board of directors, a prohibition on actions by written consent of the combined organization's stockholders, and the ability of the board of directors to issue preferred stock without stockholder approval. In addition, because the combined organization will be incorporated in Delaware, it is governed by the provisions of Section 203 of the DGCL, which prohibits stockholders owning in excess of 15% of the outstanding combined organization's voting stock from merging or combining with the combined organization. Although Mirna and Synlogic believe these provisions collectively will provide for an opportunity to receive higher bids by requiring potential acquirers to negotiate with the combined organization's board of directors, they would apply even if the offer may be considered beneficial by some stockholders. In addition, these provisions may frustrate or prevent any attempts by the combined organization's stockholders to replace or remove then current management by making it more difficult for stockholders to replace members of the board of directors, which is responsible for appointing the members of management.

Mirna and Synlogic do not anticipate the combined organization will pay any cash dividends in the foreseeable future.

The current expectation is the combined organization will retain its future earnings to fund the development and growth of the combined organization's business. As a result, capital appreciation, if any, of the Mirna Common Stock will be your sole source of gain, if any, for the foreseeable future.

Future sales of shares by existing stockholders could cause the Mirna Common Stock price to decline.

If existing Mirna Stockholders and Synlogic Stockholders sell, or indicate an intention to sell, substantial amounts of Mirna Common Stock in the public market after the post-Merger lock-up and other legal restrictions on resale discussed in this proxy statement/prospectus/information statement lapse, the trading price of Mirna Common Stock could decline. Based on shares outstanding as of June 20, 2017, upon completion of the Merger, the combined organization is expected to have outstanding a total of approximately 24.8 million shares of Mirna Common Stock (after giving effect to the proposed Mirna Reverse Stock Split). Of these shares, only approximately 7.5 million shares of Mirna Common Stock will be freely tradable, without restriction, in the public market.

The lock-up agreements entered into between Mirna and certain of the combined organization's securityholders provide that the shares subject to the lock-up restrictions will be released from such restrictions 180 days from the Closing of the Merger. Based on shares outstanding as of June 20, 2017, upon the expiration of the lock-up restrictions, approximately 17.3 million shares of Mirna Common Stock (after giving effect to the proposed Mirna Reverse Stock Split) will become eligible for sale in the public market, approximately 13.9 million of which will be held by directors, executive officers of the combined organization, and other affiliates and will be subject to volume limitations under Rule 144 under the Securities Act, and various vesting agreements. In addition, approximately 0.1 million shares of Mirna Common Stock subject to outstanding options of Mirna as of June 20, 2017 (assuming the full exercise of all such options prior to the Closing of the Merger), and approximately 0.7 million shares of Mirna Common Stock subject to outstanding options of Synlogic as of June 20, 2017 (in each case, after giving effect to the proposed Mirna Reverse Stock Split) will become eligible for sale in the public market to the extent permitted by the provisions of various vesting agreements, the lock-up agreements and Rules 144 and 701 under the Securities Act. If these additional shares are sold, or if it is perceived that they will be sold, in the public market, the trading price of the Mirna Common Stock could decline.

If the ownership of the Mirna Common Stock is highly concentrated, it may prevent you and other stockholders from influencing significant corporate decisions and may result in conflicts of interest that could cause the combined organization's stock price to decline.

Executive officers and directors of the combined organization, and affiliates of executive officers and directors of the combined organization, are expected to beneficially own or control approximately 31% of the outstanding shares of the Mirna Common Stock following the completion of the Merger (after giving effect to the exercise of all outstanding vested and unvested options and warrants). Accordingly, these executive officers, directors, and their affiliates, acting as a group, will have substantial influence over the outcome of corporate actions requiring stockholder approval, including the election of directors, any merger, consolidation, or sale of all or substantially all of the combined organization's assets or any other significant corporate transactions. These stockholders may also delay or prevent a change of control of the combined organization, even if such a change of control would benefit the other stockholders of the combined organization. The significant concentration of stock ownership may adversely affect the trading price of Mirna Common Stock due to investors' perception that conflicts of interest may exist or arise.

An active trading market for the Mirna Common Stock may not develop and the combined organization's stockholders may not be able to resell their shares of Mirna Common Stock for a profit, if at all.

Prior to the Merger, there had been no public market for Synlogic Capital Stock. An active trading market for Mirna Common Stock may never develop or be sustained. If an active market for Mirna Common Stock does not develop or is not sustained, it may be difficult for its stockholders to sell their shares at an attractive price or at all.

If the combined organization fails to maintain proper and effective internal controls, the combined organization's ability to produce accurate and timely financial statements could be impaired, which could harm its operating results, its ability to operate its business and investors' views of the combined organization.

The combined organization will be required to comply with Section 404 of the Sarbanes-Oxley Act. Section 404 of the Sarbanes-Oxley Act requires public companies to conduct an annual review and evaluation of their internal controls and attestations of the effectiveness of internal controls by independent auditors. Ensuring that the combined organization has adequate internal financial and accounting controls and procedures in place so that it can produce accurate financial statements on a timely basis is a costly and time-consuming effort that will need to be evaluated frequently. The combined organization's failure to maintain the effectiveness of its internal controls in accordance with the requirements of the Sarbanes-Oxley Act could have a material adverse effect on its business. The combined organization could lose investor confidence in the accuracy and completeness of its financial reports, which could have an adverse effect on the price of its common stock. In addition, if the combined organization's efforts to comply with new or changed laws, regulations, and standards differ from the activities intended by regulatory or governing bodies due to ambiguities related to practice, regulatory authorities may initiate legal proceedings against the combined organization and its business may be harmed.

If securities or industry analysts do not publish, or cease publishing, research or reports about the combined organization, its business or its market, or if they change their recommendations regarding the Mirna Common Stock adversely, the Mirna Common Stock price and trading volume could decline.

If a trading market for the combined organization's Mirna Common Stock develops, the trading market for its Mirna Common Stock will be influenced by whether industry or securities analysts publish research and reports about the combined organization, its business, its market or its competitors and, if any analysts do publish such reports, what they publish in those reports. The combined organization may not obtain analyst coverage in the future. Any analysts that do cover the combined organization may make adverse recommendations regarding the Mirna Common Stock, adversely change their recommendations from time to time, and/or provide more

favorable relative recommendations about the combined organization's competitors. If any analyst who may cover the combined organization in the future were to cease coverage of the combined organization or fail to regularly publish reports on the combined organization, or if analysts fail to cover the combined organization or publish reports about the combined organization at all, the combined organization could lose, or never gain, visibility in the financial markets, which in turn could cause the stock price or trading volume of the Mirna Common Stock to decline.

The combined organization will have broad discretion in the use of proceeds from Synlogic's recent Series C preferred stock financing and may invest or spend the proceeds of Synlogic's Series C preferred stock financing in ways with which you do not agree and in ways that may not increase the value of your investment.

The combined organization will have broad discretion over the use of proceeds from Synlogic's Series C financing. You may not agree with the combined organization's decisions, and its use of the proceeds may not yield any return on your investment. The combined organization's failure to apply the net proceeds of Synlogic's Series C financing effectively could compromise its ability to pursue its growth strategy and the combined organization might not be able to yield a significant return, if any, on its investment of these net proceeds. You will not have the opportunity to influence the combined organization's decisions on how to use the net proceeds from Synlogic's Series C financing.

Mirna's pre-Merger net operating loss carryforwards and certain other tax attributes may be limited. The pre-Merger net operating loss carryforwards and certain other tax attributes of Synlogic and of the combined organization may also be limited as a result of ownership changes, including as a result of the Closing of the Merger.

In general, a corporation that undergoes an "ownership change" is subject to limitations on its ability to utilize its pre-change NOLs to offset future taxable income. In general, an ownership change occurs if the aggregate stock ownership of certain stockholders, generally stockholders beneficially owning five percent or more of a corporation's common stock, applying certain look-through and aggregation rules, increases by more than 50 percentage points over such stockholders' lowest percentage ownership during the testing period, generally three years. As described in the section entitled *"Risks Related to Mirna —Mirna's ability to utilize its net operating loss carryforwards and certain other tax attributes may be limited"* in this proxy statement/prospectus/information statement, Mirna believes that it has experienced at least one ownership change in the past. Mirna may also experience additional ownership changes as a result of subsequent shifts in its stock ownership, including as a result of the Closing of the Merger. It is possible that Synlogic's net operating loss carryforwards and certain other tax attributes may also be subject to limitation as a result of ownership changes in the past and/or the Closing of the Merger. Consequently, even if the combined organization achieves profitability, it may not be able to utilize a material portion of Mirna's, Synlogic's or the combined organization's net operating loss carryforwards and certain other tax attributes, which could have a material adverse effect on cash flow and results of operations.

FORWARD-LOOKING STATEMENTS

This proxy statement/prospectus/information statement and the documents incorporated by reference into this proxy statement/prospectus/information statement contain forward-looking statements (including within the meaning of Section 21E of the United States Securities Exchange Act of 1934, as amended (the "Exchange Act"), and Section 27A of the United States Securities Act of 1933, as amended (the "Securities Act")) concerning Mirna, Synlogic, the proposed Merger and other matters. These statements may discuss goals, intentions and expectations as to future plans, trends, events, results of operations or financial condition, or otherwise, based on current beliefs of the management of Mirna, as well as assumptions made by, and information currently available to, management. Forward-looking statements generally include statements that are predictive in nature and depend upon or refer to future events or conditions, and include words such as "may," "will," "should," "would," "expect," "plan," "believe," "intend," "look forward," and other similar expressions among others. Statements that are not historical facts are forward-looking statements. Forward-looking statements are based on current beliefs and assumptions that are subject to risks and uncertainties and are not guarantees of future performance. Actual results could differ materially from those contained in any forward-looking statement as a result of various factors, including, without limitation: the risk that the conditions to the Closing are not satisfied, including the failure to timely or at all obtain stockholder approval for the Merger; uncertainties as to the timing of the consummation of the Merger and the ability of each of Mirna and Synlogic to consummate the Merger; risks related to Mirna's ability to correctly estimate its operating expenses and its expenses associated with the Merger; risks related to the changes in market price of the Mirna Common Stock relative to the Exchange Ratio; the ability of Mirna or Synlogic to protect their respective intellectual property rights; competitive responses to the Merger; unexpected costs, charges or expenses resulting from the Merger; potential adverse reactions or changes to business relationships resulting from the announcement or completion of the Merger; and legislative, regulatory, political and economic developments. The foregoing review of important factors that could cause actual events to differ from expectations should not be construed as exhaustive and should be read in conjunction with statements that are included herein and elsewhere. Mirna can give no assurance that the conditions to the Merger will be satisfied. Except as required by applicable law, Mirna undertakes no obligation to revise or update any forward-looking statement, or to make any other forward looking statements, whether as a result of new information, future events or otherwise.

For a discussion of the factors that may cause Mirna, Synlogic or the combined organization's actual results, performance or achievements to differ materially from any future results, performance or achievements expressed or implied in such forward-looking statements, or for a discussion of risks associated with the ability of Mirna and Synlogic to complete the Merger and the effect of the Merger on the business of Mirna, Synlogic and the combined organization, see the section entitled "*Risk Factors*" in this proxy statement/prospectus/information statement.

Additional factors that could cause actual results to differ materially from those expressed in the forward-looking statements are discussed in reports filed with the SEC by Mirna. See the section entitled "*Where You Can Find More Information*" in this proxy statement/prospectus/information statement. There can be no assurance that the Merger will be completed, or if it is completed, that it will be completed within the anticipated time period or that the expected benefits of the Merger will be realized.

If any of these risks or uncertainties materialize or any of these assumptions prove incorrect, the results of operations of Mirna, Synlogic or the combined organization could differ materially from the forward-looking statements. All forward-looking statements in this proxy statement/prospectus/information statement are current only as of the date on which the statements were made. Mirna and Synlogic do not undertake any obligation to publicly update any forward-looking statement to reflect events or circumstances after the date on which any statement is made, the occurrence of unanticipated events or any new information that becomes available in the future.

THE ANNUAL MEETING OF MIRNA STOCKHOLDERS

Date, Time and Place

The Annual Meeting will be held on [●], 2017, at [●] commencing at [●] local time. Mirna is delivering this proxy statement/prospectus/information statement to its stockholders in connection with the solicitation of proxies by the Mirna Board of Directors for use at the Annual Meeting and any adjournments or postponements of the Annual Meeting. This proxy statement/prospectus/information statement is first being furnished to Mirna Stockholders on or about [●], 2017.

Purposes of the Annual Meeting

The purposes of the Annual Meeting are:

1. To consider and vote upon a proposal to approve the Merger Agreement, a copy of which is attached to this proxy statement/prospectus/information statement as *Annex A*, and the transactions contemplated thereby, including the Merger and the issuance of shares of Mirna Common Stock to Synlogic Stockholders pursuant to the terms of the Merger Agreement.
2. To consider and vote upon a proposal to approve an amendment to the amended and restated certificate of incorporation of Mirna to effect the Reverse Stock Split, in the form attached to this proxy statement/prospectus/information statement as *Annex D*.
3. To consider and vote upon a proposal to approve an amendment to the amended and restated certificate of incorporation of Mirna to effect the Mirna Name Change, in the form attached to this proxy statement/prospectus/information statement as *Annex E*.
4. To consider and vote upon a proposal to elect two Class II directors to hold office until the 2020 annual meeting of stockholders or until their successors are elected (provided, however, that if the Merger is completed, the Mirna Board of Directors will be reconstituted as provided in the Merger Agreement).
5. To consider and vote upon a proposal to ratify the selection by the audit committee of the Mirna Board of Directors of Ernst & Young LLP as the independent registered public accounting firm of Mirna for its calendar year ending December 31, 2017 (provided, however, that the combined organization may decide to engage a new independent registered public accounting firm immediately or shortly after the Merger is completed).
6. To consider and vote upon a proposal to approve an adjournment of the Annual Meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1 or 2.
7. To transact such other business as may properly come before the Annual Meeting or any adjournment or postponement thereof.

Recommendation of the Mirna Board of Directors

- The Mirna Board of Directors has determined that the transactions contemplated by the Merger Agreement are fair to, advisable and in the best interests of Mirna and Mirna Stockholders and has approved and declared advisable the Merger Agreement and such transactions, including the issuance of shares of Mirna Common Stock to the Synlogic Stockholders pursuant to the terms of the Merger Agreement. The Mirna Board of Directors recommends that Mirna Stockholders vote “FOR” Proposal No. 1 to approve the Merger Agreement and the transactions contemplated thereby, including the issuance of shares of Mirna Common Stock pursuant to the terms of the Merger Agreement and the amendment to Mirna’s certificate of incorporation to effect a change in the name of Mirna to Synlogic.
- The Mirna Board of Directors has determined that the Reverse Stock Split is fair to, advisable and in the best interests of Mirna and Mirna Stockholders and has approved and declared advisable the Reverse Stock Split. The Mirna Board of Directors recommends that Mirna Stockholders vote “FOR” Proposal No. 2 to approve an amendment to the amended and restated certificate of incorporation of Mirna effecting the Reverse Stock Split.

- The Mirna Board of Directors has determined that the Mirna Name Change is fair to, advisable and in the best interests of Mirna and Mirna Stockholders and has approved and declared advisable the Mirna Name Change. The Mirna Board of Directors recommends that Mirna Stockholders vote "FOR" Proposal No. 3 to approve an amendment to the amended and restated certificate of incorporation of Mirna to effect the Mirna Name Change.
- The Mirna Board of Directors recommends that Mirna Stockholders vote "FOR" Proposal No. 4 to elect each of Lawrence M. Alleva and Michael Powell, Ph.D., as Class II directors.
- The Mirna Board of Directors recommends that Mirna Stockholders vote "FOR" Proposal No. 5 to ratify the selection of Ernst & Young LLP as Mirna's independent registered public accounting firm for the calendar year ending December 31, 2017.
- The Mirna Board of Directors has determined and believes that adjourning the Annual Meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1 or 2 is advisable to, and in the best interests of, Mirna and Mirna Stockholders. The Mirna Board of Directors recommends that Mirna Stockholders vote "FOR" Proposal No. 6 to adjourn the Annual Meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal Nos. 1 or 2.

Mirna Stockholders should understand, however, that if the Merger is completed, the effect of the approval of Proposals Nos. 4 and 5 may be limited since the composition of the Mirna Board of Directors will be changed upon completion of the Merger in accordance with the Merger Agreement and the combined organization may decide to engage a new independent registered public accounting firm immediately or shortly after completion of the Merger.

Record Date and Voting Power

Only holders of record of Mirna Common Stock at the close of business on the Record Date, [●], 2017, are entitled to notice of, and to vote at, the Annual Meeting. There were approximately [●] holders of record of Mirna Common Stock at the close of business on the Record Date. At the close of business on the Record Date, [●] shares of Mirna Common Stock were issued and outstanding. Each share of Mirna Common Stock entitles the holder thereof to one vote on each matter submitted for stockholder approval at the Annual Meeting. See the section entitled "*Principal Stockholders of Mirna*" in this proxy statement/prospectus/information statement for information regarding persons known to the management of Mirna to be the beneficial owners of more than 5% of the outstanding shares of Mirna Common Stock.

Voting and Revocation of Proxies

The proxy accompanying this proxy statement/prospectus/information statement is solicited on behalf of the Mirna Board of Directors for use at the Annual Meeting.

If you are a stockholder of record of Mirna as of the Record Date referred to above, you may vote in person at the Annual Meeting or vote by proxy using the enclosed proxy card. Whether or not you plan to attend the Annual Meeting, Mirna urges you to vote by proxy to ensure your vote is counted. You may still attend the Annual Meeting and vote in person if you have already voted by proxy. As a stockholder of record:

- *to vote in person*, attend the Annual Meeting and Mirna will provide you a ballot when you arrive;
- *to vote using the proxy card*, simply mark, sign and date your proxy card and return it promptly in the postage-paid envelope provided; if you return your signed proxy card to Mirna before the Annual Meeting, Mirna will vote your shares as you direct; and
- *to vote by telephone or on the Internet*, dial the phone number on the proxy card or voting instruction form or visit the website on the proxy card or voting instruction form to complete an electronic proxy card; you will be asked to provide the company number and control number from the enclosed proxy card and your vote must be received by 11:59 p.m. Eastern time on [●], 2017, to be counted.

If your shares of Mirna Common Stock are held in an account at a brokerage firm, bank, dealer or other similar organization, that is, in "street name," you should receive voting instructions from the organization that holds your shares. If you do not give instructions to such organization, as your nominee, such nominee can vote your shares of Mirna Common Stock with respect to "discretionary" items but not with respect to "non-discretionary" items. Discretionary items are proposals considered routine under the rules of NASDAQ for which your broker or other agent may vote shares held in "street name" in the absence of your voting instructions. On non-discretionary items for which you do not give your broker or other agent instructions, the shares of Mirna Common Stock will be treated as broker non-votes. It is anticipated that all proposals other than Proposal Nos. 5 and 6 will be non-discretionary items.

All properly executed proxies that are not revoked will be voted at the Annual Meeting and at any adjournments or postponements of the Annual Meeting in accordance with the instructions contained in the proxy. If a holder of shares of Mirna Common Stock executes and returns a proxy and does not specify otherwise, the shares of Mirna Common Stock represented by that proxy will be voted "FOR" all of the proposals in accordance with the recommendation of the Mirna Board of Directors.

Mirna Stockholders of record, other than those Mirna Stockholders who have executed support agreements, may change their vote at any time before their proxy is voted at the Annual Meeting in one of three ways:

- send timely written notice to Mirna's Corporate Secretary stating that the stockholder would like to revoke its proxy;
- submit new proxy instructions either on a new proxy card or via phone or the Internet; or
- attend the Annual Meeting and vote in person. Simply attending the Annual Meeting will not, by itself, revoke your proxy.

If a Mirna Stockholder of record who owns shares of Mirna Common Stock in "street name" has instructed a broker to vote its shares of Mirna Common Stock, the stockholder must follow the directions received from its broker to change those instructions.

Required Vote

The presence, in person or represented by proxy, at the Annual Meeting of the holders of a majority of the shares of Mirna Common Stock outstanding and entitled to vote at the Annual Meeting is necessary to constitute a quorum at the Annual Meeting. Abstentions and broker non-votes will be counted toward a quorum. The affirmative vote of a majority of the votes cast in person or by proxy at the Annual Meeting, assuming a quorum is present, is required for approval of Proposal Nos. 1, 5 and 6. The affirmative vote of the holders of a majority of shares of Mirna Common Stock having voting power outstanding on the Record Date is required for approval of Proposal Nos. 2 and 3. With respect to Proposal No. 4, the two nominees receiving the most "FOR" votes (from the votes of shares present in person or represented by proxy and entitled to vote on the election of directors) will be elected. Broker non-votes will not be counted towards the vote total for Proposal No. 4. Each of Proposal Nos. 1 and 2 are conditioned upon each other and the approval of each such proposal is a condition to the completion of the Merger. Therefore, the Merger cannot be consummated without the approval of Proposal Nos. 1 and 2.

Votes will be counted by the inspector of election appointed for the Annual Meeting, who will separately count "FOR," "AGAINST" and "WITHHOLD" votes, abstentions and broker non-votes. "WITHHOLD" votes with respect to the election of one or more nominees for director pursuant to Proposal No. 4 will not be voted with respect to the director or directors indicated, although they will be counted for purposes of determining the presence of a quorum for the transaction of business at the Annual Meeting. Abstentions and broker non-votes will also be treated as shares present for the purpose of determining the presence of a quorum for the transaction of business at the Annual Meeting. Abstentions and broker non-votes will not, however, be considered votes cast at the Annual Meeting and will therefore not have any effect with respect to Proposal Nos. 1, 4, 5 and 6. Abstentions and broker non-votes will have the same effect as "AGAINST" votes for Proposal Nos. 2 and 3.

As of May 31, 2017, the directors and executive officers of Mirna beneficially owned approximately 20% of the outstanding shares of Mirna Common Stock entitled to vote at the Annual Meeting, including 14% of the outstanding shares of Mirna Common Stock which are beneficially owned by funds affiliated with Sofinnova Venture Partners, L.P., an investment fund with which one of Mirna's directors is affiliated. Additionally 14% of the shares of outstanding Mirna Common Stock entitled to vote at the Annual Meeting are beneficially owned by funds affiliated with New Enterprise Associates 14, L.P., an investment firm with which one of Mirna's directors is affiliated. Certain of the directors and executive officers of Mirna and each of the two referenced investment firms are subject to support agreements. Each Mirna Stockholder that entered into a support agreement has agreed to vote all shares of Mirna Common Stock owned by such holder as of the Record Date (a) in favor of (i) the approval of the Merger Agreement, (ii) the approval of the transactions contemplated therein, including the issuance of shares of Mirna Common Stock pursuant to the Merger Agreement, (iii) the adoption of an amendment to Mirna's amended and restated certificate of incorporation to effect the Reverse Stock Split, (iv) the adoption of an amendment to Mirna's amended and restated certificate of incorporation to effect the Mirna Name Change, (v) any proposal to adjourn or postpone the Annual Meeting to a later date, if there are not sufficient votes for the approval of the Merger Agreement and the transactions contemplated therein, including the issuance of Mirna Common Stock pursuant to the Merger Agreement on the date on which such meeting is held, and (vi) any other proposal included in the proxy statement in connection with, or related to, the consummation of the Merger for which the Mirna Board of Directors has recommended that Mirna Stockholders vote in favor; and (b) against any competing acquisition proposal with respect to Mirna. As of May 31, 2017, Mirna is not aware of any affiliate of Synlogic owning any shares of Mirna Common Stock entitled to vote at the Annual Meeting.

Solicitation of Proxies

In addition to solicitation by mail, the directors, officers, employees and agents of Mirna may solicit proxies from Mirna Stockholders by personal interview, telephone, telegram or otherwise. Mirna and Synlogic will share equally the costs of printing and filing this proxy statement/prospectus/information statement and proxy card. Arrangements will also be made with brokerage firms and other custodians, nominees and fiduciaries who are record holders of Mirna Common Stock for the forwarding of solicitation materials to the beneficial owners of Mirna Common Stock. Mirna will reimburse these brokers, custodians, nominees and fiduciaries for the reasonable out-of-pocket expenses they incur in connection with the forwarding of solicitation materials. Mirna has retained MacKenzie Partners to assist it in soliciting proxies using the means referred to above. Mirna will pay the fees of MacKenzie Partners, which Mirna expects to be approximately $7,500, plus reimbursement of out-of-pocket expenses.

Other Matters

As of the date of this proxy statement/prospectus/information statement, the Mirna Board of Directors does not know of any business to be presented at the Annual Meeting other than as set forth in the notice accompanying this proxy statement/prospectus/information statement. If any other matters should properly come before the Annual Meeting, it is intended that the shares represented by proxies will be voted with respect to such matters in accordance with the judgment of the persons voting the proxies.

THE MERGER

This section and the section entitled "The Merger Agreement" in this proxy statement/prospectus/information statement describe the material aspects of the Merger, including the Merger Agreement. While Mirna and Synlogic believe that this description covers the material terms of the Merger and the Merger Agreement, it may not contain all of the information that is important to you. You should read carefully this entire proxy statement/prospectus/information statement for a more complete understanding of the Merger and the Merger Agreement, including the Merger Agreement attached to this proxy statement/prospectus/information statement as Annex A, the opinion of Wedbush attached as Annex B, and the other documents to which you are referred herein. See the section entitled "Where You Can Find More Information" in this proxy statement/prospectus/information statement.

Background of the Merger

The Mirna Board of Directors and Mirna's executive management regularly review Mirna's operating and strategic plans, both near-term and long-term, as well as various strategic alternatives in an effort to enhance stockholder value. These reviews and discussions have focused on, among other things, the opportunities and risks associated with Mirna's business and financial condition, potential partnering opportunities and strategic relationships, and other strategic options. Following the observance of multiple immune-related severe adverse events in patients dosed with MRX34, Mirna's investigational microRNA therapy, on September 20, 2016, Mirna announced its decision to close its ongoing Phase 1 study of MRX34. Shortly after the announcement of the closure of its Phase 1 study, and the subsequent full clinical hold on the MRX34 IND by the FDA on September 28, 2016, the Mirna Board of Directors initiated a process to explore and evaluate strategic alternatives available to Mirna that ultimately resulted in the execution of the Merger Agreement with Synlogic. The terms of the Merger Agreement are the result of extensive arm's-length negotiations among members of the Strategy Committee (as defined below), Mirna's management team, and the management team of Synlogic along with their respective advisors and under the guidance of each company's board of directors. Mirna followed a careful process assisted by experienced outside financial, scientific and legal advisors to rigorously examine potential transactions and transaction candidates through broad outreach to life sciences companies and a thorough process of evaluation of prospective strategic partners. The following is a summary of the background of the process undertaken by Mirna, the identification and evaluation of strategic alternatives and the negotiation of the Merger Agreement.

Following announcement of Mirna's decision to close its ongoing Phase 1 study of MRX34, on September 20, 2016, Dr. Paul Lammers, Mirna's chief executive officer and president, received separate telephone calls from two representatives of Company A, a clinical stage biopharmaceutical company developing microRNA therapies. During such calls, the representatives of Company A expressed to Dr. Lammers that Company A may be interested in exploring a strategic transaction with Mirna whereby Mirna would acquire all of the outstanding shares of Company A using Mirna Common Stock as consideration for such acquisition at a fixed exchange ratio. On September 28, 2016, Mirna and Company A executed a mutual nondisclosure agreement which did not include a standstill provision. Following execution of the nondisclosure agreement, members of Mirna's management held an introductory meeting with Company A to discuss Company A's business and a potential strategic transaction involving Mirna. During such introductory meeting, representatives of Company A indicated to Mirna's management that Company A was already pursuing a strategic transaction of its own such that, if Mirna's management and the Mirna Board of Directors were interested in pursuing a transaction with Company A, any diligence and negotiation towards such a transaction would be on an accelerated timeline.

On September 29, 2016, a financial advisor of Company B, a regenerative medicine company with American Depository Receipts ("ADRs") listed on NASDAQ, sent an email to Dr. Lammers to introduce Dr. Lammers to the chief executive officer of Company B. Later on September 29, 2016, members of Mirna's management and the chief executive officer of Company B held an introductory telephonic meeting to discuss Company B's business and a potential strategic transaction involving Mirna.

On September 30, 2016, the Mirna Board of Directors participated in a telephonic meeting which was also attended by members of Mirna's management and representatives of Latham & Watkins LLP ("Latham & Watkins"), Mirna's outside legal counsel. At the meeting, Dr. Lammers reviewed with the Mirna Board of Directors recent interactions members of Mirna's management had with Company A and Company B regarding a potential strategic transaction involving Mirna. During such discussion, Dr. Lammers noted that during the introductory meeting with Mirna's management and representatives of Company A, representatives of Company A indicated that Company A was already pursuing a strategic transaction and that, as a result, any interest Mirna had in pursuing a strategic transaction with Company A would need to be acted upon within a matter of weeks. Following discussion of Mirna's strategic alternatives after the clinical hold placed on Mirna's MRX34 program, including the value of Mirna's assets and potential business combination transactions that Mirna may be interested in pursuing, the Mirna Board of Directors determined that it would be in the best interests of Mirna and the Mirna Stockholders to conduct a full and robust process to explore and evaluate potential strategic alternatives, and that, as such, Mirna was not in a position to pursue a potential strategic transaction with Company A on the accelerated timeline suggested by representatives of Company A. The Mirna Board of Directors then directed Mirna's management to communicate to representatives of Company A Mirna's appreciation of Company A's interest, but that Mirna would not be able to further explore a strategic transaction with Company A based on the accelerated timeline suggested by representatives of Company A. The Mirna Board of Directors then further directed management to consider and explore strategic alternatives that may be available to Mirna, including a potential strategic transaction with Company B and, to that end, to identify a financial advisor with appropriate experience and expertise to assist with Mirna's consideration of strategic alternatives in the interest of maximizing the value of any strategic transaction to the Mirna Stockholders.

During October 2016, Dr. Lammers communicated with representatives of several biotechnology companies for the purpose of gauging such companies potential interest in pursuing a strategic transaction with Mirna. Such communications were informal in nature and did not include the exchange of non-public information and, with the exception of Company B, did not result in the receipt of an indication of interest from any such company at such time.

On October 3, 2016, Mirna and Company B executed a mutual nondisclosure agreement which did not include a standstill provision. Following execution of the nondisclosure agreement, Mirna provided members of Company B's management with access to Mirna's virtual data room.

Between October 3, 2016 and October 13, 2016, Dr. Lammers participated in several telephonic meetings with the chief executive officer of Company B to discuss the businesses of Company B and Mirna, respectively, and Company B's interest in pursuing a strategic transaction with Mirna.

On October 13, 2016, the chief executive officer of Company B delivered an indication of interest for a business combination transaction involving Mirna and Company B to Dr. Lammers by email. The indication of interest contemplated Company B's acquisition of all of the outstanding shares of Mirna using Company B's ADRs as consideration for such acquisition at a fixed exchange ratio. The aggregate value of such consideration was less than Mirna's then-current balance of cash, cash equivalents and short-term marketable securities.

On October 14, 2016, the Mirna Board of Directors participated in a telephonic meeting which was also attended by members of Mirna's management and representatives of Latham & Watkins. At the meeting, Dr. Lammers provided an update on Mirna's efforts to wind-down its Phase 1 clinical trial of MRX34 and reviewed with the participants certain requests from the U.S. Food and Drug Administration with respect to the trial. Dr. Lammers then reviewed with the participants the proposed criteria that Mirna's management had developed to begin its identification and evaluation of candidates to a potential strategic transaction. Dr. Lammers then reviewed with the Mirna Board of Directors recent discussions between members of Mirna's management and Company B with respect to a potential strategic transaction involving Company B and Mirna and the indication of interest received from Company B. Dr. Lammers noted that preliminary due diligence as between Mirna and Company B had begun and reviewed with the Mirna Board of Directors information with

respect to Company B's clinical pipeline and development progress. Following discussion, the Mirna Board of Directors directed management to continue discussions with Company B, but to inform Company B that the consideration contemplated by its indication of interest was inadequate. Dr. Lammers then discussed with the Mirna Board of Directors certain discussions held between other potential strategic partners and members of Mirna's management. Dr. Lammers then reviewed with the participants management's efforts to identify and retain a financial advisor as directed by the Mirna Board of Director's at the September 30, 2016 meeting of the Mirna Board of Directors. Dr. Lammers noted that three investment banks, including Wedbush, had expressed interest and were being considered to advise Mirna in connection with its consideration of a potential strategic transaction. Following discussion, the Mirna Board of Directors provided feedback to management on each interested investment bank, including directing management to conduct further diligence on each such investment bank's relative qualifications and expertise in transactions similar to those Mirna may pursue, including industry expertise and knowledge, access to potential transaction candidates and recent transaction experience.

On October 15, 2016, at the direction of the Mirna Board of Directors, Dr. Lammers informed the chief executive officer of Company B via email that, although the Mirna Board of Directors appreciated receiving the offer, the Mirna Board of Directors considered the consideration contemplated by Company B's indication of interest to be inadequate and that management had been instructed to continue its evaluation of potential strategic alternatives.

On October 27, 2016, members of Mirna's management, representatives of Latham & Watkins and representatives of Wedbush participated in a telephonic meeting. At the meeting, representatives of Wedbush reviewed the proposed process to be undertaken to identify and evaluate potential strategic alternatives and parties that may be interested in pursuing a strategic transaction with Mirna. The participants discussed, among other matters, the anticipated timeline for evaluation and consideration of strategic alternatives, contacting, receiving and evaluating proposals from potentially interested parties and the preparation of diligence materials by Mirna that would likely be requested by such potentially interested parties. The participants also reviewed proposed selection criteria to be used in identifying and evaluating candidates to a potential strategic transaction and reviewed a proposed bid letter prepared by Wedbush to be sent to interested parties. Following discussion, the members of Mirna's management participating in the call determined to recommend to the Mirna Board of Directors the formal engagement of Wedbush as Mirna's financial advisor in connection with the pursuit of a potential strategic transaction.

On October 28, 2016, the chief executive officer of Company B sent an email to Dr. Lammers informing him that Company B intended to submit a revised indication of interest.

On November 2, 2016, the chief executive officer of Company B delivered a second revised indication of interest for a business combination transaction involving Mirna and Company B to Dr. Lammers by email. The indication of interest contemplated Company B's acquisition of all of the outstanding shares of Mirna for a fixed value and consideration consisting of a combination of ADRs and cash. The aggregate value of such consideration was less than Mirna's then-current balance of cash, cash equivalents and short-term marketable securities.

On November 2, 2016, the Mirna Board of Directors participated in a telephonic meeting which was also attended by members of Mirna's management, a representative of Latham & Watkins and representatives of Wedbush. At the meeting, Dr. Lammers discussed, among other matters, Mirna's ongoing assessment of the MRX34 program and management's efforts to close out Mirna's Phase 1 trial evaluating MRX34. Dr. Lammers also discussed Mirna's recent efforts with respect to exploring strategic alternatives in light of the status of its MRX34 program and reviewed with the participants recent meetings and discussions by and between management and representatives of Wedbush. Following discussion, Dr. Lammers proposed that the Mirna Board of Directors establish a committee of the Mirna Board of Directors to meet with and advise management in connection with the process Mirna planned to undertake to identify and evaluate potential strategic alternatives

and to oversee any financial advisor engaged by Mirna and the process intended to facilitate a strategic transaction. Following discussion, the members of the Mirna Board of Directors present approved the proposal and a special strategic committee (the "Strategy Committee") was established, with Mr. Edward Mathers, Mr. Peter Greenleaf, Dr. Lammers and Dr. Powell appointed to serve on the Strategy Committee. The members of the Strategy Committee were selected by the Mirna Board of Directors based primarily on the members' knowledge of and experience with strategic transactions, experience in evaluating the prospects and relative value of potential strategic partners, operational and executive experience, diversity of professional experience and ability to meet the time commitments of service on such committee. Also at the meeting, representatives of Wedbush reviewed with the Mirna Board of Directors such representatives' and Wedbush's background and expertise in advising public life sciences companies in connection with the evaluation of strategic alternatives and presented an overview of potential strategic alternatives that may be available to Mirna, including a reverse merger transaction with a private company. The representatives of Wedbush also presented a timeline and process for Mirna's exploration of strategic alternatives. Following such discussion, Dr. Lammers reviewed with the participants the revised indication of interest received from Company B, including the value ascribed to Mirna in such indication of interest. Following discussion, the Mirna Board of Directors directed Dr. Lammers to communicate to the chief executive officer of Company B that the consideration contemplated by Company B's revised indication of interest was inadequate. During an executive session of the same meeting, the representative of Latham & Watkins gave a presentation to the Mirna Board of Directors concerning its fiduciary duties under Delaware law in connection with exploration of potential strategic alternatives. Following the presentation of Latham & Watkins, the participants discussed Mirna's MRX34 program and the implications for Mirna going forward of the recent clinical hold placed on Mirna's clinical trial for MRX34 by the FDA. Following discussion, the members of the Mirna Board of Directors present at the meeting expressed their support for the recommendations of Mirna's management that Mirna discontinue all clinical and development activities and proceed to engage Wedbush as Mirna's financial advisor in connection with Mirna's exploration and evaluation of strategic alternatives, subject to negotiation and execution of an engagement letter with Wedbush.

On November 3, 2016, Dr. Lammers sent an email to the chief executive officer of Company B indicating that Mirna would not be accepting Company B's offer as the consideration contemplated by the revised indication of interest was inadequate and that management had been instructed to continue its evaluation of potential strategic alternatives.

On November 15 and November 16, 2016, Dr. Lammers and the chief executive officer of Company B exchanged emails regarding certain diligence matters and Dr. Lammers reiterated that the consideration contemplated by the revised indication of interest was inadequate.

On November 21, 2016, the chief executive officer of Company B delivered a third revised indication of interest for a business combination transaction involving Mirna and Company B to Dr. Lammers by email. The indication of interest contemplated Company B's acquisition of all of the outstanding shares of Mirna using Company B's ADRs as consideration for such acquisition with an exchange ratio based in part upon Mirna's cash balance at the closing of such transaction, plus a fixed premium to such balance.

On November 23, 2016, a telephonic meeting of the Strategy Committee was held, which was also attended by members of Mirna's management and a representative of Latham & Watkins. During the meeting, Dr. Lammers reviewed with the Strategy Committee the third revised indication of interest received from Company B. The participants discussed, among other matters, the then-current market capitalization of Company B, the proposed post-closing ownership of Mirna Stockholders contemplated by the indication of interest and Company B's business and later stage of development, which members of the Strategy Committee noted was less likely to provide Mirna Stockholders with the potential for significant value appreciation as compared to earlier stage companies. Following discussion, the Strategy Committee directed Dr. Lammers to solicit feedback on Company B's business from representatives of Wedbush and to inform Company B that Mirna intended to proceed with a robust process of identifying and evaluating potential parties to a strategic transaction involving Mirna and that Mirna welcomed Company B's participation in such process. At the direction of the Strategy

Committee, Dr. Lammers communicated this message to Company B's chief executive officer by email on November 25, 2016, following Dr. Lammers' discussion with representatives of Wedbush.

On November 23, 2016, Mirna formally engaged Wedbush to advise on potential strategic alternatives for Mirna to maximize stockholder value.

Beginning in November 2016 and continuing through January 2017, Wedbush, with assistance from the Strategy Committee, members of Mirna's management and representatives of Latham & Watkins, conducted a process of identifying and evaluating potential parties to a strategic transaction involving Mirna. In its outreach efforts, Wedbush contacted a broad set of companies that met the criteria established by the Mirna Board of Directors in consultation with Mirna's management and representatives of Wedbush and that consisted predominantly of private biotechnology and pharmaceutical companies possessing (i) a portfolio of commercialized products or a portfolio of product development candidates with the potential for significant value appreciation, (ii) resources sufficient to achieve potentially meaningful development milestones within such portfolio, including resources to be obtained through financing activities consummated prior to the effectiveness of a combination with Mirna, (iii) an ability to enter into an agreement in the near-term for a combination with a public company (i.e., Mirna) and thereafter proceed in an orderly manner toward implementing the combination (necessitating, for example, the availability of the requisite financial statements to accompany a registration statement on Form S-4) and (iv) a management team with the breadth and skills to accomplish the foregoing. At the direction of the Mirna Board of Directors, Wedbush contacted 142 potential parties to gauge their interest in a potential transaction with Mirna, many of which parties had indicated preliminary interest to be included in Mirna's process during communications with Mr. Lammers in October 2016. On behalf of Mirna, Wedbush obtained executed nondisclosure agreements from 56 potentially interested parties, a number of which contained customary standstill provisions which, in each case, terminated upon Mirna's entry into the Merger Agreement with Synlogic, sent bid process letters to 40 potentially interested parties and, in response thereto, Mirna's management attended management presentations delivered by 39 potentially interested parties and received a total of 24 non-binding proposals, including from Synlogic, Company B, Company C, Company D, Company E and Company F. During the same period, as part of its consideration of interested parties, Mirna's management received and reviewed preliminary due diligence materials from several interested parties.

On January 19, 2017, a meeting of the Mirna Board of Directors was held which was also attended by members of Mirna's management, representatives of Latham & Watkins and representatives of Wedbush. At the meeting, representatives of Wedbush provided an update with respect to the process of exploring potential strategic transactions and summarized certain statistics regarding the outreach efforts of Wedbush, the Strategy Committee and members of Mirna's management, including the number of potentially interested parties contacted, the number of management presentations held to date and the timeline for submission of non-binding proposals by potentially interested parties. The representatives of Wedbush also discussed with the participants a proposed timeline for review of non-binding proposals, ranking of candidates based on numerical values assessed based on the criteria previously determined by the Mirna Board of Directors and Mirna's management and circulation to the top ranking candidates of a draft merger agreement.

On January 20, 2017, members of Mirna's management and certain members of the Mirna Board of Directors held a telephonic meeting with members of management of Company C, a privately-held biotechnology company with a pipeline of programs across various stages of development focused on the treatment of rare diseases. During such meeting, Company C's management provided an overview of Company C's business and programs.

On January 31, 2017, a telephonic meeting of the Strategy Committee was held, which was also attended by members of Mirna's management, representatives of Latham & Watkins and representatives of Wedbush. During the meeting, representatives of Wedbush reviewed with the participants various outreach efforts that Wedbush had undertaken on behalf of Mirna to gauge potential interest in a strategic transaction with Mirna, including, among other things, details on the number of confidentiality agreements distributed and executed, potential

partners targeted, meetings requested and held with such potential partners, and non-binding proposals received by Mirna. Following such review, the Strategy Committee reviewed each non-binding proposal received and undertook to rank each potential partner based on numerical values placed on various criteria and considerations previously identified by the Mirna Board of Directors and Mirna's management. In connection with such review and ranking, representatives of Wedbush reviewed with the participants the key terms of each non-binding proposal, including a summary of each potential partner, its product pipeline and financing history, the relative valuations of each such potential partner and Mirna in each non-binding proposal, whether each such non-binding proposal contemplated the potential partner's pursuit of a concurrent financing, the post-closing ownership of Mirna Stockholders proposed by each such non-binding proposal and the composition of the board of directors of the combined entity, including the number of members of the board of directors of the combined entity that Mirna would be entitled to designate pursuant to each such non-binding proposal. Following such review and ranking and an extensive discussion regarding each potential partner and non-binding proposal, the Strategy Committee determined that it was in the best interest of Mirna and Mirna Stockholders for the representatives of Wedbush and Latham & Watkins and Mirna's management to focus on exploring a potential strategic transaction with the top five potential partners, each of whom had given in-person management presentations to Mirna's management and delivered a non-binding proposal to Mirna in January 2017, by providing to each such potential partner an initial draft merger agreement and participating in in-person due diligence meetings with each such potential partner. The Strategy Committee directed the representatives of Wedbush and Latham & Watkins and Mirna's management to (i) deliver an initial draft merger agreement to the top five ranked potential partners, Company C, Company D, Company E, Company F and Synlogic (the "Finalist Candidates" and each a "Finalist Candidate"), (ii) continue reviewing potential strategic transactions with the next highest ranking subset of potential partners, and (iii) to dismiss from further consideration the lowest ranking subset of potential partners, including Company B. The Strategy Committee also discussed the fact that Mirna's director Edward Mathers is associated with a venture capital firm with equity interests in each of Synlogic and Company E and that Mr. Mathers is also a member of the board of directors of each of Synlogic and Company E. In light of such interests, Mr. Mathers stated that he would recuse himself from deliberations of the Mirna Board of Directors and the Strategy Committee with respect to Synlogic and Company E.

During the period beginning in February 2017 and continuing through April 2017, Mirna's management, members of the Strategy Committee, representatives of Wedbush and representatives of Latham & Watkins conducted due diligence on each of the Finalist Candidates, including review of materials provided by each Finalist Candidate and participation in various due diligence meetings and calls. Similarly, during the same period, Mirna provided due diligence materials to each of the Finalist Candidates and responded to diligence inquiries posed by each such Finalist Candidate.

On February 1, 2017, Company D, a privately-held biotechnology company with clinical and preclinical antibacterial programs, provided members of Mirna's management and representatives of Latham & Watkins with access to Company D's virtual data room. Also on February 1, 2017, Company F, a privately-held oncology focused biotechnology company, provided members of Mirna's management and representatives of Latham & Watkins with access to Company F's virtual data room.

On February 2, 2017, Synlogic provided members of Mirna's management and representatives of Latham & Watkins with access to Synlogic's virtual data room.

On February 8, 2017, Company E, a clinical stage privately-held biopharmaceutical company focused on ophthalmology therapeutics, provided members of Mirna's management and representatives of Latham & Watkins with access to Company E's virtual data room.

On February 10, 2017, representatives of Wedbush circulated an initial draft of the merger agreement and a list of due diligence questions to representatives of Company C, Company D, Company E, Company F and Synlogic.

On February 14, 2017, members of the Strategy Committee participated in an in-person due diligence meeting with representatives of Company E.

On February 15, 2017, Company C provided members of Mirna's management with access to Company C's virtual data room. Also on February 15, 2017, members of the Strategy Committee participated in an in-person due diligence meeting with representatives of Company C and also participated in an in-person due diligence meeting with representatives of Company D.

On February 16, 2017, members of the Strategy Committee participated in an in-person due diligence meeting with representatives of Company F and also participated in an in-person due diligence meeting with representatives of Synlogic.

On February 17, 2017, a telephonic meeting of the Strategy Committee was held, which was also attended by members of Mirna's management, representatives of Latham & Watkins and representatives of Wedbush. During the meeting, the participants discussed the results of in-person due diligence meetings with each Finalist Candidate and the further ranking of each Finalist Candidate based on due diligence findings and the non-binding proposal submitted by each Finalist Candidate. Following such discussion, the Strategy Committee and members of Mirna's management agreed that Synlogic, Company C and Company D were the top priority candidates in Mirna's consideration of a potential strategic transaction. Specifically, the members of the Strategy Committee noted the following favorable attributes of each of Synlogic, Company C and Company D relative to the other Finalist Candidates: (i) depth of product pipelines with potential for significant value appreciation, (ii) quality and experience of management team and (iii) quality and support of existing investors. The members of the Strategy Committee also noted that the valuation ascribed to Company C and the post-closing ownership of Mirna Stockholders contemplated by Company C's non-binding proposal was relatively less favorable than similar attributes of the non-binding proposal of each of Synlogic and Company D. The participants further discussed the appropriate approach to be taken with each of the Finalist Candidates in light of the identification of the three priority candidates. Following such discussion, the Strategy Committee directed Mirna's management and representatives of Wedbush and Latham & Watkins to actively pursue a potential transaction with Company C and Synlogic, with further negotiation with Company C regarding valuation and the post-closing ownership of Mirna Stockholders, while conducting further diligence of and participating in further discussions with Company D. The participants then discussed immediate next steps for the pursuit of a strategic transaction with Company C and Synlogic and further diligence efforts with respect to Company D, including further evaluation of the proposed valuation of each such candidate, the anticipated receipt of comments to the draft merger agreement from each such candidate and follow up diligence inquiries to be sent to each such candidate. With respect to Company E and Company F, the Strategy Committee determined to inform each such candidate that Mirna would be prioritizing the other Finalist Candidates in the next stage of the process.

On February 24, 2017, representatives of Wedbush, on behalf of Mirna's management, delivered additional due diligence questions to representatives of Synlogic and Company D, respectively.

On February 27, 2017, representatives of Synlogic delivered additional due diligence questions to representatives of Wedbush and Wedbush circulated the same to Mirna's management and representatives of Latham & Watkins. Also on February 27, 2017, representatives of Company D delivered additional due diligence questions to representatives of Wedbush and Wedbush circulated the same to Mirna's management and representatives of Latham & Watkins.

On March 1, 2017, representatives of Company D delivered to representatives of Wedbush responses to certain due diligence questions delivered to Company D by Wedbush. Wedbush circulated such responses to Mirna's management and representatives of Latham & Watkins.

On March 2, 2017, representatives of Synlogic delivered to representatives of Wedbush responses to certain due diligence questions previously delivered to Synlogic by Wedbush.

On March 7, 2017, representatives of Wedbush, on behalf of Mirna's management, delivered to representatives of Synlogic responses to certain due diligence questions previously delivered to Wedbush by Synlogic. Also on March 7, 2017, representatives of Wedbush, on behalf of Mirna's management, delivered additional due diligence questions to representatives of Company D.

On March 8, 2017, representatives of Company D delivered to representatives of Wedbush responses to certain due diligence questions previously delivered to Company D by Wedbush. Wedbush circulated such responses to Mirna's management and representatives of Latham & Watkins.

On March 9, 2017, a representative of Wedbush participated in a call with the chief executive officer of Company C to discuss matters relating to Company C's non-binding proposal. During the call, the chief executive officer of Company C stated that Company C was in the process of completing a significant financing and, as such, Company C would no longer require participation by Mirna's investors in a concurrent financing as part of a potential strategic transaction between Company C and Mirna and that Company C would not be reducing the post-closing ownership of Mirna Stockholders contemplated by Company C's non-binding proposal as a result of such financing.

On March 9, 2017, a telephonic meeting of the Strategy Committee was held, which was also attended by members of Mirna's management, representatives of Latham & Watkins and representatives of Wedbush. At the meeting, representatives of Wedbush updated the Strategy Committee on the various efforts Wedbush had recently undertaken on behalf of Mirna to identify a candidate for a potential strategic transaction involving Mirna, including due diligence with respect to each Finalist Candidate and continued evaluation of each Finalist Candidate's non-binding proposal in light of such continued due diligence. Representatives of Wedbush also provided the Strategy Committee with an update with respect to the non-binding proposal received from Company C and the discussion between Wedbush and the chief executive officer of Company C which had taken place earlier in the day. Representatives of Wedbush explained to the Strategy Committee that the respective valuations ascribed to Company C and Mirna in Company C's non-binding proposal were based on Mirna's participation in a concurrent financing to be consummated by Company C and that, in light of Company C's recent financing, the ownership ratio set forth in Company C's non-binding proposal was now more favorable to Mirna Stockholders. The representatives of Wedbush also reviewed the non-binding proposal received from Synlogic and Company D, including with respect to the respective valuations ascribed to Synlogic or Company D, as applicable, and Mirna therein, any required participation in a concurrent financing and the number of board of director positions that would be allocated to Mirna pursuant to each such non-binding proposal. The representatives of Wedbush noted that Company D's non-binding proposal contemplated a concurrent financing which would require existing Mirna Stockholders or new investors in Mirna to invest approximately $25 million in the combined entity. The Strategy Committee also noted that Synlogic's non-binding proposal did not specify the allocation of board of director positions among Synlogic and Mirna designees and that the non-binding proposal received from Company C allocated only one board of directors position to Mirna. The Strategy Committee then discussed further ranking Company C, Company D and Synlogic to identify the top two candidates with whom Mirna should continue to actively engage to pursue a potential strategic transaction. Following discussion, the Strategy Committee determined that the non-binding proposals of Company C and Synlogic were more favorable than the non-binding proposal submitted by Company D, including in view of Mirna's required participation in Company D's concurrent financing, but that the composition of the board of directors of the combined entity, including the number of board of directors positions allocated to Mirna in each of Company C's and Synlogic's non-binding proposal, would need to be further considered and negotiated with Company C and Synlogic, respectively, and that pursuit of a potential transaction with Company C would require discussion with Company C's management as to the identity of the investors in its recent financing. Further, the Strategy Committee noted that none of Company C, Company D or Synlogic had provided a revised draft of the merger agreement and that the strength of each of their respective non-binding proposals, and their ranking relative to each other, would be influenced by each candidate's comments to the initial draft merger agreement. Following further discussion of the strengths and weaknesses of the non-binding proposals received from each of Company C, Company D and Synlogic, the Strategy Committee identified

Company C and Synlogic as the top ranking Finalist Candidates and directed Mirna's management, representatives of Wedbush and representatives of Latham & Watkins to continue to actively pursue a potential transaction with Company C and Synlogic and to continue to engage with Company D in the process as a potential alternative, but not as a top ranking potential partner and subject in all cases to receipt and review of comments to the initial draft merger agreement by each such candidate.

On March 10, 2017, a representative of Wedbush participated in a call with the chief executive officer of Company C. During the call, the representative of Wedbush discussed the Strategy Committee's request for the identity of the investors in Company C's recent financing and indicated that the Strategy Committee would be more receptive to a potential transaction with Company C if Mirna were allocated more than one position on the combined entity's board of directors. The chief executive officer of Company C indicated that the allocation of one board of directors position to Mirna in Company C's non-binding proposal was commensurate with Mirna's ownership of the combined entity and that Company C was not willing to allocate additional board of directors positions to Mirna. Also during the call, the chief executive officer of Company C indicated to the representative of Wedbush that, in light of the organizational structure of Company C, the merger agreement would require substantial redrafting and, as such, Company C's comments to the initial draft merger agreement would be delayed.

On March 14, 2017, representatives of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., outside legal counsel to Synlogic ("Mintz Levin"), delivered, on behalf of Synlogic, a revised draft of the merger agreement to representatives of Latham & Watkins. Also on March 14, 2017, representatives of Synlogic delivered additional due diligence questions to representatives of Wedbush and Wedbush circulated the same to Mirna's management and representatives of Latham & Watkins. Further on March 14, 2017, representatives of Wedbush, on behalf of Mirna, requested that representatives of Company C provide a list of due diligence items necessary for Company C to complete its due diligence efforts.

On March 16, 2017, members of Mirna's management participated in a call with representatives of Company C to discuss Mirna's anticipated future cash utilization. On the same day, members of Mirna's management also participated in a call with representatives of Synlogic to discuss Mirna's anticipated expenditures and cash balance at any closing of a transaction.

On March 17, 2017, members of Mirna's management participated in a clinical due diligence call with representatives of Synlogic. During the call, representatives of Synlogic inquired about Mirna's CPRIT grant awards and any implications the transaction may have on such grant awards. Later on March 27, 2017, Dr. Lammers participated in a call with Dr. Gutierrez Ramos, the chief executive officer of Synlogic to discuss Mirna's CPRIT grant awards.

Also on March 17, 2017, a representative of Wedbush received a telephone call from the chief executive officer of Company C who stated that Company C was pursuing an ongoing business development opportunity and, as such, would not be in a position to further negotiate a potential transaction with Mirna at the present time and that resumption of negotiations wouldn't be possible until completion of such business development opportunity, which was expected to occur, at the earliest, in late April or early May.

Also on March 17, 2017, a telephonic meeting of the Strategy Committee was held, which was also attended by members of Mirna's management, representatives of Latham & Watkins and representatives of Wedbush. During the meeting, Dr. Lammers provided the participants with an update with respect to management's negotiation of an amendment of certain agreements between CPRIT and Mirna (the "CPRIT Matters") and management's efforts and continued progress towards resolution of the CPRIT Matters, including anticipated next steps. Dr. Lammers noted that on a recent due diligence call with representatives of Synlogic and members of Mirna's management, representatives of Synlogic inquired about the CPRIT grant awards. Dr. Lammers requested that the Strategy Committee discuss an approach to communicate Mirna's strategy for resolution of the CPRIT Matters with each of Company C, Company D and Synlogic, as continued due diligence with each party

would necessitate discussion of the CPRIT Matters. Also during the meeting, a representative of Wedbush informed the participants of the meeting that such representative had received from the chief executive officer of Company C stating that Company C was pursuing an ongoing business development opportunity and, as such, would not be in a position to further negotiate a potential strategic transaction with Mirna at the present time and that resumption of negotiations wouldn't be possible until completion of such business development opportunity, which was expected to occur, at the earliest, in late April or early May. In light of the withdrawal of Company C from immediate negotiations, the Strategy Committee discussed next steps with Synlogic, including whether Mirna should propose entering into an exclusivity agreement with Synlogic, as well as resuming active negotiations with Company D by soliciting from Company D comments to the draft merger agreement. Following discussion, the Strategy Committee determined not to pursue exclusivity with Synlogic, but that active negotiation with Company D should resume. The Strategy Committee directed Mirna's management, representatives of Latham & Watkins and representatives of Wedbush to continue negotiations with Synlogic and to solicit comments to the draft merger agreement from Company D. The Strategy Committee further directed representatives of Wedbush to convey to Company C Mirna's disappointment that Company C would need to withdraw from negotiations for the present time, but not to foreclose the possibility of resumed discussions following completion of Company C's business development opportunity.

On March 20, 2017, members of Mirna's management participated in a due diligence call with the scientific co-founders and chief scientific officer of Synlogic.

On March 21, 2017, members of Mirna's management participated in a clinical due diligence call with representatives of Synlogic.

Also on March 21, 2017, a representative of Wedbush participated in a call with a representative of Company D. During the call, the representative of Company D indicated that before providing a revised draft of the merger agreement Company D would like to resolve certain of the open business terms proposed in Company D's non-binding proposal and in the draft merger agreement, including Mirna's ability to participate in a concurrent financing to be consummated by Company D in connection with a potential strategic transaction between Company D and Mirna.

On March 22, 2017, members of Mirna's management participated in a due diligence call with representatives of Synlogic to discuss process development and manufacturing matters.

On March 23, 2017, representatives of Latham & Watkins and representatives of Mintz Levin participated in a call to discuss certain provisions of the draft merger agreement, including, among other matters, required consents, Synlogic's organizational structure and required restructuring prior to a potential strategic transaction with Mirna, and any pre-closing or concurrent financing contemplated by Synlogic in connection with the potential transaction. Also on March 23, 2017, members of Mirna's management and representatives of Synlogic participated in a due diligence call to discuss budget and contracting matters.

On March 24, 2017, representatives of Company D delivered to representatives of Wedbush an initial issues list setting forth Company D's comments to certain provisions of the draft merger agreement. Wedbush circulated Company D's issues list to Mirna's management and representatives of Latham & Watkins. Later on March 24, 2017, members of Mirna's management participated in a call with representatives of Synlogic to review and discuss Synlogic's financial model.

Also on March 24, 2017, a telephonic meeting of the Strategy Committee was held, which was attended by members of Mirna's management, representatives of Latham & Watkins and representatives of Wedbush. During the meeting, Dr. Powell provided an update on management's progress with respect to the CPRIT Matters, including a summary of recent meetings and discussions between Mirna's management and CPRIT officials. The participants discussed the process undertaken by Mirna's management in connection with resolution of the CPRIT Matters and appropriate next steps and, following such discussion, the Strategy Committee directed

Mirna's management to arrange another meeting with CPRIT officials to propose the resolution discussed. Also during the meeting, a representative of Wedbush reviewed with the participants the status of efforts undertaken by Mirna's management, representatives of Wedbush and representatives of Latham & Watkins with respect to a potential strategic transaction involving Mirna. The representative of Wedbush indicated that Synlogic remained very interested in pursuing a strategic transaction and that representatives of Synlogic had recently indicated that Synlogic intended to pursue a concurrent financing in an amount as of yet to be determined. The representative also noted that representatives of Company D had delivered to Wedbush an initial issues list based on the draft merger agreement and requested that representatives of Company D and Mirna's management first discuss the issues list before Company D returns a revised draft of the merger agreement. Dr. Powell also noted that one of his colleagues had participated in a discussion with the chief executive officer of Company C and that the chief executive officer of Company C indicated continued interest in a potential strategic transaction with Mirna, but reiterated that Company C could not pursue a transaction with Mirna until the completion of Company C's ongoing business development opportunity. The Strategy Committee discussed potential strategies for maintaining Company C's interest while continuing negotiations with Synlogic and Company D.

On March 31, 2017, representatives of Mintz Levin delivered a revised draft of the merger agreement to representatives of Latham & Watkins and Wedbush. The draft included revisions to the definition of net cash, the termination provisions, closing conditions, and fees and expenses.

In April 2017, director Larry Alleva replaced director Ed Mathers on the Strategy Committee.

On April 3, 2017, representatives of Cooley LLP, counsel to Company D, delivered to representatives of Wedbush a revised non-binding proposal, a pro-forma capitalization table and initial comments to the draft merger agreement. Representatives of Wedbush circulated the same to Mirna's management and representatives of Latham & Watkins.

On April 4, 2017, members of Mirna's management participated in a call with representatives of Synlogic to discuss certain due diligence matters, including the CPRIT Matters.

On April 10, 2017, representatives of Wedbush, on behalf of Mirna, delivered to representatives of Synlogic responses to certain due diligence inquiries made by Synlogic.

On April 11, 2017, representatives of Latham & Watkins delivered a revised draft of the merger agreement to representatives of Mintz Levin. The draft included revisions to the termination provisions, closing conditions, and fees and expenses.

On April 13, 2017, representatives of Latham & Watkins participated in a call with representatives of Cooley LLP to discuss the revised draft merger agreement delivered by Cooley LLP, on behalf of Company D, on April 3, 2017.

On April 14, 2017, members of Mirna's management participated in a call with representatives of Company D to discuss Mirna's anticipated future cash utilization.

On April 19, 2017, representatives of Synlogic provided additional due diligence inquiries to representatives of Wedbush. Also on April 19, 2017, members of Mirna's management participated in a due diligence call with members of Company D's management and a consultant engaged by Company D.

On April 20, 2017, representatives of Synlogic provided additional due diligence inquiries to representatives of Wedbush.

On April 25, 2017, representatives of Synlogic delivered to representatives of Wedbush responses to certain intellectual property due diligence inquiries made by Mirna.

On April 28, 2017, members of Mirna's management, representatives of Wedbush, representatives of Latham & Watkins, members of Synlogic's management and representatives of Mintz Levin participated in a due diligence call to discuss real estate matters.

On May 2, 2017, members of Mirna's management, representatives of Wedbush, representatives of Latham & Watkins, members of Synlogic's management and representatives of Mintz Levin participated in call to discuss, among other matters, certain due diligence matters, the CPRIT Matters and certain outstanding issues in the draft merger agreement, including Mirna's minimum net cash closing condition, certain expense reimbursement provisions in connection with a termination of the merger agreement and composition of the combined entity's board of directors.

On May 3, 2017, representatives of Mintz Levin delivered a revised draft of the merger agreement to representatives of Latham & Watkins, representatives of Wedbush and members of Mirna's management. The draft included revisions to the representations and warranties, covenants regarding insurance, closing conditions, and fees and expenses.

On May 8, 2017, representatives of Latham & Watkins delivered a revised draft of the merger agreement to representatives of Mintz Levin. The draft included revisions to the representations and warranties, covenants regarding insurance, closing conditions, and fees and expenses.

On May 9, 2017, members of Mirna's management, representatives of Wedbush, representatives of Latham & Watkins, members of Synlogic's management and representatives of Mintz Levin participated in a call to discuss, among other matters, any outstanding due diligence items, a timeline for finalization of the draft merger agreement and next steps for completion of ancillary documents and signing of the merger agreement.

Later on May 9, 2017, representatives of Latham & Watkins and representatives of Mintz Levin participated in a call to discuss certain open issues in the merger agreement, including closing conditions related to governmental proceedings and certain interim operating covenants related to the CPRIT Matters. Also on May 9, 2017, representatives of Mintz Levin delivered a revised draft of the merger agreement to representatives of Latham & Watkins. The draft included revisions to the representations and warranties, covenants regarding insurance, closing conditions, and fees and expenses.

On May 10, 2017, representatives of Latham & Watkins delivered a revised draft of the Merger Agreement to representatives of Mintz Levin. The draft included revisions to covenants regarding the termination of contracts.

Also on May 10, 2017, a meeting of the Mirna Board of Directors was held, which was also attended by members of Mirna's management, representatives of Latham & Watkins and representatives of Wedbush. Mr. Mathers recused himself from the meeting. At the meeting Dr. Lammers provided the participants an update regarding the current status of the strategic transaction process and resolution of the CPRIT Matters and summarized the processes undertaken by Mirna's management, the Strategy Committee and Mirna's legal and financial advisors in pursuit of consummation of a strategic transaction and resolution of the CPRIT Matters. Dr. Powell then noted that it was the Strategy Committee's recommendation to the Mirna Board of Directors that the Mirna Board of Directors approve the merger agreement and Mirna's continued pursuit of a strategic transaction with Synlogic. Representatives of Latham & Watkins then reviewed with the Mirna Board of Directors a summary of the key terms of the merger agreement which had been circulated to each member of the Mirna Board of Directors in advance of the meeting, including a review of, among other matters, the Exchange Ratio, conditions to closing, post-closing ownership of Mirna Stockholders and Synlogic Stockholders, and a review of the lock-up agreement and support agreement that the Mirna Board of Directors would be asked to approve. Representatives of Wedbush reviewed with the Mirna Board of Directors its preliminary valuation analysis and draft fairness opinion as circulated to the Mirna Board of Directors in advance of the meeting and noted that its final valuation analysis and fairness opinion would be circulated to the Mirna Board of Directors in

advance of the meeting of the Mirna Board of Directors scheduled for May 15, 2017, and responded to questions from the participants regarding Wedbush's valuation analysis. Dr. Lammers then reviewed with each participant the timeline for review and finalization of all transaction documents prior to the meeting of the Mirna Board of Directors scheduled for May 15, 2017, and reviewed the agenda for the May 15, 2017 meeting, the purpose of which Dr. Lammers indicated was to vote on the approval of the merger agreement, the transactions contemplated thereby, and continued pursuit of a strategic transaction with Synlogic. Following Dr. Lammers's review of the proposed timeline, representatives of Latham & Watkins led a discussion with the Mirna Board of Directors regarding its fiduciary duties under Delaware law in the context of consideration of a strategic transaction with Synlogic. Members of Mirna's management then reviewed with the Mirna Board of Directors the status of negotiations for the resolution of the CPRIT Matters and, following discussion and upon motion duly made, the Mirna Board of Directors approved the proposed resolution of the CPRIT Matters as discussed at the meeting.

On May 11, 2017, representatives of Latham & Watkins and representatives of Mintz Levin participated in a call to discuss certain of Mirna's insurance policies. Later on May 11, 2017, representatives of Latham & Watkins and representatives of Mintz Levin participated in call to discuss outstanding issues in the merger agreement and ancillary documents thereto. Also on May 11, 2017, representatives of Mintz Levin delivered a revised draft of the merger agreement to representatives of Latham & Watkins.

Also on May 11, 2017, representatives of Wedbush participated in a call with representatives of Company D during which the representatives of Company D indicated that Company D would not further negotiate the draft merger agreement until Mirna had confirmed to Company D Mirna's ability to invest in a concurrent financing to be consummated by Company D in connection with any potential transaction between Company D and Mirna. The representatives of Wedbush explained to Company D that Mirna would not be in a position to commit to an investment in a concurrent financing until Mirna and its representatives and advisors had received a revised draft of the merger agreement from Company D.

Also on May 11, 2017, representatives of Company C informed representatives of Wedbush that Company C's business development opportunity had not yet been consummated and, as such, Company C remained unable to negotiate towards a potential strategic transaction with Mirna. The representatives of Company C indicated that Company C would not be in a position to re-engage with Mirna for at least six weeks and that, in any event, the proposed valuation set forth in the non-binding proposal submitted by Company C would need to be revisited if negotiations were to resume.

On May 15, 2017, representatives of Latham & Watkins and Mintz Levin exchanged revised drafts of the merger agreement and participated in a call to discuss outstanding items related to signing, including finalization of the merger agreement and ancillary documents related thereto.

Later on May 15, 2017, the Mirna Board of Directors held a telephonic meeting which was attended by members of Mirna's management, representatives of Wedbush and representatives of Latham & Watkins. Mr. Mathers recused himself from the meeting. At the meeting, Dr. Lammers updated the participants on Synlogic's recent successful completion of its concurrent financing and reviewed the process undertaken by the Strategy Committee to identify potential strategic transactions, the Strategy Committee's determination to select Synlogic and the steps taken by the Strategy Committee to ensure a thorough review and consideration of the terms of the merger agreement, including retention of Wedbush and Latham & Watkins. Also at the meeting, representatives of Latham & Watkins reviewed with the Mirna Board of Directors the revised terms of the merger agreement that had been further negotiated from the draft previously circulated to the Mirna Board of Directors and reviewed at the meeting of the Mirna Board of Directors held on May 10, 2017 (as reflected in a marked copy of the merger agreement and updated summary of the terms of the merger agreement that had been circulated to the Mirna Board of Directors in advance of the meeting), including minor revisions to Mirna's covenant to provide certain insurance coverage and an adjustment to the Mirna allocation percentage based on the actual proceeds of Synlogic's concurrent financing. Representatives of Latham & Watkins also reviewed with

the participants the final forms of the support agreement and lock-up agreement to be entered into by the directors and officers and certain significant stockholders of Synlogic. The Mirna Board of Directors then engaged in a discussion of the revised terms of the merger agreement and the other transaction documents and asked questions of the representatives of Latham & Watkins regarding the merger agreement, which were answered during Latham & Watkins's presentation. Representatives of Latham & Watkins reviewed with the Mirna Board of Directors the Board's fiduciary duties under Delaware law in connection with the consideration of the merger agreement and the transactions contemplated therein, noting that the Mirna Board of Directors had previously received a presentation of its fiduciary duties at a meeting of the Mirna Board of Directors held on November 2, 2016, and again at the last meeting of the Mirna Board of Directors held on May 10, 2017. Representatives of Wedbush then reviewed its final valuation analysis and fairness opinion as circulated to the Mirna Board of Directors in advance of the meeting and delivered its oral opinion (subsequently confirmed in writing and attached hereto as Annex B) to the effect that, as of the date of the meeting, and based upon and subject to the considerations, limitations and other matters set forth in its written opinion, the Exchange Ratio was fair, from a financial point of view, to Mirna Stockholders. During the presentations, members of the Mirna Board of Directors asked questions and discussed the revised terms of the merger agreement and Wedbush's valuation analysis and fairness opinion. After these presentations and discussions, representatives of Latham & Watkins reviewed with the Mirna Board of Directors the proposed resolutions that had been provided to the Mirna Board of Directors in advance of the meeting. Following review and discussion amongst the participants, the Mirna Board of Directors (i) determined that the transactions contemplated by the merger agreement, including the Merger and the issuance of shares of Mirna Common Stock to Synlogic Stockholders pursuant to the merger agreement were fair to, advisable and in the best interest of Mirna and Mirna Stockholders; (ii) approved and declared advisable the merger agreement and the transactions contemplated therein, including the Merger and the issuance of shares of Mirna Common Stock to Synlogic Stockholders, and (iii) determined to recommend, upon the terms and subject to the conditions of the merger agreement, that Mirna Stockholders vote to approve the merger agreement and the transactions contemplated therein, including the Merger and the issuance of shares of Mirna Common Stock to Synlogic Stockholders and, if deemed necessary, the Mirna Reverse Stock Split.

Following the meeting, the merger agreement and related documents were executed and delivered by Mirna, Synlogic and the other applicable parties. Following execution of the Merger Agreement, Mirna and Synlogic issued a joint press release announcing the execution of the Merger Agreement and the related documents prior to the open of trading of shares of Mirna Common Stock on May 16, 2017.

Mirna Reasons for the Merger

The Mirna Board of Directors considered the following factors in reaching its conclusion to approve the Merger Agreement and the transactions contemplated thereby and to recommend that Mirna Stockholders approve the Merger Agreement, and thereby approve the Merger and the other transactions contemplated by the Merger Agreement, including the issuance of shares of Mirna Common Stock in the Merger, all of which the Mirna Board of Directors viewed as supporting its decision to approve the business combination with Synlogic:

- The Mirna Board of Directors and its financial advisor undertook a comprehensive and through process of reviewing and analyzing potential merger candidates to identify the opportunity that would, in the Mirna Board of Directors's opinion, create the most value for Mirna Stockholders.
- The Mirna Board of Directors believes that, as a result of arm's length negotiations with Synlogic, Mirna and its representatives negotiated the highest exchange ratio that Synlogic was willing to agree to, and that the terms of the Merger Agreement include the most favorable terms to Mirna in the aggregate to which Synlogic was willing to agree.
- The Mirna Board of Directors believes, after a thorough review of strategic alternatives and discussions with Mirna's senior management, financial advisors and legal counsel, that the Merger is more favorable to Mirna Stockholders than the potential value that might have resulted from other strategic options available to Mirna.

- The Mirna Board of Directors believes, based in part on scientific diligence and analysis of Synlogic's product pipeline, its therapeutic discovery capabilities, the potential market opportunity for its products and the expertise of its scientific team, which was conducted over several weeks by Mirna's management and reviewed with the Mirna Board of Directors, that Synlogic's potential product candidates represent a sizeable market opportunity, and may thereby create value for the stockholders of the combined organization and an opportunity for Mirna Stockholders to particulate in the potential growth of the combined organization.
- The Mirna Board of Directors also reviewed with the management of Mirna and the management of Synlogic the current plans of Synlogic for developing SYNB1020 and SYNB1618 to confirm the likelihood that the combined organization would possess sufficient financial resources to allow the management team to focus on the continued development and anticipated commercialization of those development candidates. The Mirna Board of Directors also considered the possibility that the combined organization would be able to take advantage of the potential benefits resulting from the combination of Mirna's public company structure with Synlogic's business to raise additional funds in the future, if necessary.
- The Mirna Board of Directors also considered the strength of the balance sheet of the combined organization resulting from Synlogic's approximately $42.0 million private placement, completed concurrently with the execution of the Merger Agreement, in addition to the approximately $40 million of net cash that Mirna is expected to have immediately prior to the consummation of the Merger.
- The Mirna Board of Directors also considered that the combined organization will be led by an experienced senior management team and a board of directors with representation from each of the current boards of directors of Mirna and Synlogic.
- The Mirna Board of Directors considered the financial analyses of Wedbush, including its opinion to the Mirna Board of Directors as to the fairness to Mirna Stockholders, from a financial point of view as of the date of the opinion, of the Exchange Ratio, as more fully described below under the caption "*The Merger—Opinion of the Mirna Financial Advisor*."

The Mirna Board of Directors also reviewed various factors impacting the financial condition, results of operations and prospects for Mirna, including:

- the strategic alternatives to the Merger, including potential transactions that could have resulted from discussions that Mirna's management conducted with other potential merger partners;
- the consequences of negative results from the MRX34 clinical trial, and the likelihood that the resulting circumstances for Mirna would not change for the benefit of Mirna Stockholders in the foreseeable future on a stand-alone basis;
- the loss of the operational capabilities of Mirna, and the risks associated with continuing to operate Mirna on a stand-alone basis, including the need to rebuild infrastructure and management to continue its operations;
- the risks associated with, and the limited value and high costs of, liquidating Mirna and thereafter distributing the proceeds to Mirna Stockholders; and
- Mirna's potential inability to maintain its listing on the NASDAQ Global Market without completing the Merger.

The Mirna Board of Directors also reviewed the terms and conditions of the Merger Agreement and associated transactions, as well as the safeguards and protective provisions included therein intended to mitigate risks, including:

- the initial Exchange Ratio used to establish the number of shares of Mirna Common Stock to be issued to Synlogic Stockholders in the Merger was determined based on the relative valuations of the

companies, and thus the relative percentage ownership of Mirna Stockholders and Synlogic Stockholders immediately following the completion of the Merger is subject to adjustment only based on the amount of Mirna's net cash immediately prior to Closing;

- the limited number and nature of the conditions to Synlogic's obligation to consummate the Merger and the limited risk of non-satisfaction of such conditions as well as the likelihood that the Merger will be consummated on a timely basis;
- the respective rights of, and limitations on, Mirna and Synlogic under the Merger Agreement to consider certain unsolicited Acquisition Proposals under certain circumstances should Mirna or Synlogic receive a superior offer;
- the reasonableness of the potential termination fee of $2.0 million and related reimbursement of certain transaction expenses of up to $1.0 million, which could become payable by either Mirna or Synlogic if the Merger Agreement is terminated in certain circumstances;
- the support agreements, pursuant to which certain directors, officers and stockholders of Mirna and Synlogic have agreed, solely in their capacity as stockholders of Mirna and Synlogic, respectively, to vote all of their shares of Mirna Common Stock or Synlogic Capital Stock in favor of the approval or adoption, respectively, of the Merger Agreement;
- the agreement of Synlogic to provide the written consent of Synlogic Stockholders necessary to adopt the Merger Agreement thereby approving the Merger and related transactions within two business days of the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, becoming effective;
- the belief that the terms of the Merger Agreement, including the parties' representations, warranties and covenants, and the conditions to their respective obligations, are reasonable under the circumstances.

In the course of its deliberations, the Mirna Board of Directors also considered a variety of risks and other countervailing factors related to entering into the Merger, including:

- the $2.0 million termination fee and up to $1.0 million in related expense reimbursement obligations payable by Mirna to Synlogic upon the occurrence of certain events and the potential effect of such fees in deterring other potential acquirers from proposing an alternative transaction that may be more advantageous to Mirna Stockholders;
- the substantial expenses to be incurred in connection with the Merger, including the costs associated with any related litigation;
- the possible volatility, at least in the short term, of the trading price of Mirna Common Stock resulting from the announcement of the Merger;
- the risk that the Merger might not be consummated in a timely manner or at all and the potential adverse effect of the public announcement of the Merger or delay or failure to complete the Merger on the reputation of Mirna;
- the likely detrimental effect on Mirna's cash position, stock price and ability to initiate another process and to successfully complete an alternative transaction should the Merger not be completed;
- the risk to Mirna's business, operations and financial results in the event that the Merger is not consummated, including the diminution of Mirna's cash and its likely inability to raise additional capital through the public or private sale of equity securities;
- the likelihood of disruptive stockholder litigation following announcement of the Merger;
- the unproven, early-stage nature of Synlogic's product candidates, which may not be successfully developed into products that are marketed and sold;

- the strategic direction of the combined organization following the completion of the Merger, which will be determined by a board of directors initially comprised of a majority of the directors designated by Synlogic;
- the fact that the Merger could result in substantial limits on the utilization of Mirna's NOLs; and
- various other risks associated with the combined organization and the Merger, including those described in the section entitled *"Risk Factors"* in this proxy statement/prospectus/information statement.

The foregoing information and factors considered by the Mirna Board of Directors are not intended to be exhaustive but are believed to include all of the material factors considered by the Mirna Board of Directors. In view of the wide variety of factors considered in connection with its evaluation of the Merger and the complexity of these matters, the Mirna Board of Directors did not find it useful to attempt, and did not attempt, to quantify, rank or otherwise assign relative weights to these factors. In considering the factors described above, individual members of the Mirna Board of Directors may have given different weight to different factors. The Mirna Board of Directors conducted an overall analysis of the factors described above, including thorough discussions with, and questioning of, Mirna's management team, members of the Strategy Committee and the legal and financial advisors of Mirna, and considered the factors overall to be favorable to, and to support, its determination.

Synlogic Reasons for the Merger

The following discussion sets forth material factors considered by the Synlogic Board of Directors in reaching its determination to approve the Merger Agreement and approve the Merger; however, it may not include all of the factors considered by the Synlogic Board of Directors. In light of the number and wide variety of factors considered in connection with its evaluation of the Merger Agreement and the Merger, the Synlogic Board of Directors did not consider it practicable to, and did not attempt to, quantify or otherwise assign relative weights to the specific factors it considered in reaching its determination. The Synlogic Board of Directors viewed its position and determinations as being based on all of the information available and the factors presented to and considered by it. In addition, individual directors may have given different weight to different factors.

In the course of reaching its decision to approve the Merger, the Synlogic Board of Directors consulted with Synlogic's senior management, financial and tax advisors and legal counsel, reviewed a significant amount of information and considered a number of factors, including, among others:

- historical and current information concerning Synlogic's business, including its financial performance and condition, operations, management and competitive position;
- the potential increased access to sources of capital and a broader range of investors to support the clinical development of its therapeutic candidates following consummation of the transaction compared to if Synlogic continued to operate as a privately held company;
- the potential to provide current Synlogic Stockholders with greater liquidity by owning stock in a public company;
- the Synlogic Board of Directors's belief that no alternatives to the Merger were reasonably likely to create greater value for Synlogic Stockholders, after reviewing the various financing and other strategic options to enhance stockholder value that were considered by the Synlogic Board of Directors;
- the cash resources of the combined organization expected to be available at the Closing relative to the anticipated burn rate of the combined organization;
- the availability of appraisal rights under the DGCL to Synlogic Stockholders who comply with the required procedures under the DGCL, which allow such Synlogic Stockholders to seek appraisal of the fair value of their shares of Synlogic Capital Stock as determined by the Delaware Court of Chancery;

- the expectation that the Merger would be a higher probability and more cost-effective means to access capital than other options considered by the Synlogic Board of Directors, including additional private financings or an initial public offering;
- the terms and conditions of the Merger Agreement, including, without limitation, the following:
  - the determination that the expected relative percentage ownership of Mirna Stockholders and Synlogic Stockholders in the combined organization was appropriate, in the judgment of the Synlogic Board of Directors, based on the Synlogic Board of Directors's assessment of the approximate valuations of Mirna (including the value of the net cash Mirna is expected to provide to the combined organization) and Synlogic (including the value of the net cash Synlogic is expected to provide to the combined organization);
  - the expectation that the Merger will be treated as a reorganization for U.S. federal income tax purposes;
  - the limited number and nature of the conditions to the obligation of Mirna to consummate the Merger;
  - the rights of Synlogic under the Merger Agreement to consider certain unsolicited acquisition proposals under certain circumstances should Synlogic receive a superior proposal;
  - the conclusion of the Synlogic Board of Directors that the potential termination fee of $2.0 million, or in some situations the reimbursement of certain transaction expenses incurred in connection with the Merger of up to $1.0 million, payable by Mirna or Synlogic to the other party, and the circumstances when such fee may be payable, were reasonable; and
  - the belief that the other terms of the Merger Agreement, including the parties' representations, warranties and covenants, and the conditions to their respective obligations, were reasonable in light of the entire transaction;
- the fact that shares of Mirna Common Stock issued to Synlogic Stockholders will be registered on a Form S-4 registration statement and will become freely tradable for Synlogic Stockholders who are not affiliates of Synlogic and who are not parties to lock-up agreements;
- the support agreements, pursuant to which certain directors, officers and stockholders of Mirna and Synlogic, respectively, have agreed, solely in their capacity as stockholders of Mirna and Synlogic, respectively, to vote all of their shares of Synlogic Capital Stock or Mirna Common Stock in favor of the adoption or approval, respectively, of the Merger Agreement;
- the ability to obtain a NASDAQ listing and the fact that Mirna will, subject to approval by Mirna Stockholders of Proposal No. 3, change its name to "Synlogic, Inc." upon the Closing;
- the fact that the proposed Merger may enable certain stockholders of Mirna and Synlogic to increase the value of their current shareholding; and
- the likelihood that the Merger will be consummated on a timely basis.

The Synlogic Board of Directors also considered a number of uncertainties and risks in its deliberations concerning the Merger and the other transactions contemplated by the Merger Agreement, including the following:

- the possibility that the Merger might not be completed and the potential adverse effect of the public announcement of the Merger on the reputation of Synlogic and the ability of Synlogic to obtain financing in the future in the event the Merger is not completed;
- the fact that the Exchange Ratio is not subject to adjustment based on the price of Mirna Common Stock, which the Synlogic Board of Directors determined is appropriate to determine relative percentage ownership of Mirna's and Synlogic's security holders;

- the termination fee of $2.0 million, or in some situations the reimbursement of certain transaction expenses incurred in connection with the Merger of up to $1.0 million, payable by Synlogic to Mirna upon the occurrence of certain events, and the potential effect of such fees in deterring other potential acquirers from proposing an alternative transaction that may be more advantageous to Synlogic Stockholders;
- the risk that the Merger might not be consummated in a timely manner or at all;
- the expenses to be incurred in connection with the Merger and related administrative challenges associated with combining the companies;
- the additional expenses and obligations to which Synlogic's business will be subject following the Merger that Synlogic has not previously been subject to, and the operational changes to Synlogic's business, in each case that may result from being a public company;
- the fact that the representations and warranties in the Merger Agreement do not survive the Closing and the potential risk of liabilities that may arise post-Closing; and
- various other risks associated with the combined organization and the Merger, including the risks described in the section entitled "Risk Factors" in this proxy statement/prospectus/information statement.

The Synlogic Board of Directors weighed the benefits, advantages and opportunities of a potential transaction against the uncertainties and risks described above, as well as the possible diversion of Synlogic's management's attention for an extended period of time. After taking into account these and other factors, the Synlogic Board of Directors approved and authorized the Merger Agreement and the transactions contemplated thereby, including the Merger.

Opinion of the Mirna Financial Advisor

Scope of the Assignment

In November 2016, the Mirna Board of Directors engaged Wedbush to provide strategic advisory and investment banking services in connection with evaluating and considering various strategic alternatives, and ultimately requested that Wedbush render an opinion as to whether the consideration to be paid by Mirna in the Merger, as provided in the Merger Agreement, was fair, from a financial point of view, to the Mirna Stockholders. At the May 15, 2017 meeting of the Mirna Board of Directors, Wedbush rendered its oral opinion, subsequently confirmed by delivery of a written opinion dated May 15, 2017, to the Mirna Board of Directors that, as of the date of such opinion, and based upon the assumptions made, procedures followed, matters considered, and qualifications and limitations of the review set forth in its written opinion, the consideration to be paid by Mirna in the Merger was fair, from a financial point of view, to the Mirna Stockholders. For purposes of Wedbush's opinion, the term "consideration" means the total number of shares of Mirna Common Stock to be issued in the Merger.

The full text of Wedbush's written opinion, which sets forth the procedures followed, assumptions made, matters considered, and qualifications and limitations of the review undertaken in connection with such opinion, is attached to this proxy statement/prospectus/information statement as Annex B and is incorporated by reference in its entirety to this proxy statement/prospectus/information statement. Wedbush's opinion was intended solely for the benefit and use of the Mirna Board of Directors (in its capacity as such) in connection with its consideration of the Merger. Wedbush's opinion was not intended to be used for any other purpose without Wedbush's prior written consent in each instance, except as expressly provided for in the engagement letter between Mirna and Wedbush. Wedbush has consented to the use of Wedbush's opinion in this proxy statement/prospectus/information statement. Wedbush's opinion did not address Mirna's underlying business decision to enter into the Merger Agreement or complete the Merger or the merits of the Merger as compared to any alternative transactions that were or may be available to Mirna, and did not constitute a recommendation to the

Mirna Board of Directors or to any Mirna Stockholder as to how such stockholder should vote with respect to the Merger or otherwise. The following summary of Wedbush's opinion is qualified in its entirety by reference to the full text of such opinion.

For purposes of its opinion and in connection with its review, Wedbush, among other things:

- reviewed a draft of the Merger Agreement dated May 15, 2017;
- reviewed certain publicly available business and financial information relating to Mirna and Synlogic, respectively;
- reviewed certain internal information, primarily financial in nature, including financial and operating data furnished to Wedbush by the managements of Mirna and Synlogic, respectively, and approved for Wedbush's use by Mirna;
- reviewed certain publicly available information with respect to other companies in the biopharmaceutical industry that Wedbush believed to be similar in certain respects, in whole or in part, to Synlogic;
- considered the financial terms, to the extent publicly available, of selected recent business combinations and initial public offerings of companies in the biopharmaceutical industry that Wedbush believed to be similar in certain respects to Synlogic, in whole or in part, and to the Merger; and
- made inquiries regarding and discussed the draft Merger Agreement and other matters related thereto with Mirna's and Synlogic's counsel.

In addition, Wedbush held discussions with the managements of Mirna and Synlogic concerning their views as to the financial and other information described in the bullet points above. Wedbush also conducted such other analyses and examinations and considered such other financial, economic and market criteria as Wedbush deemed appropriate to arrive at its opinion.

In its opinion, Wedbush noted that the Merger Agreement provided that the percentage ownership interest of Mirna Stockholders after giving effect to the Merger would be subject to adjustment in the event that Mirna's "net cash" as determined pursuant to the Merger Agreement was less than or greater than $40 million. For purposes of Wedbush's opinion, Mirna's management advised Wedbush, and Wedbush assumed without independent verification that (i) Mirna's net cash would be $40.0 million as of immediately prior to the Closing, (ii) the percentage ownership interest of Mirna Stockholders after giving effect to the Merger would be 16.9%, (iii) and the percentage ownership interest of Synlogic Stockholders after giving effect to the Merger would be 83.1%. Wedbush expressly disclaimed any opinion as to (i) the reasonableness of these assumptions, (ii) the amount of Mirna's net cash as of immediately prior to the Closing, (iii) the final Exchange Ratio determined pursuant to the Merger Agreement, (iv) the final percentage ownership interest of Mirna Stockholders after giving effect to the Merger, (v) the final percentage ownership interest of Synlogic Stockholders after giving effect to the Merger, or (vi) the actual number of shares of Mirna Common Stock to be issued in the Merger.

In rendering its opinion, Wedbush assumed and relied upon the accuracy and completeness of all information that was publicly available or was furnished to or discussed with Wedbush by Mirna or Synlogic or otherwise reviewed by Wedbush. With respect to information provided to or reviewed by it, Wedbush was advised by the managements of Mirna and Synlogic that such information was reasonably prepared on bases reflecting the best currently available estimates and judgments of the management of Mirna or Synlogic, as applicable. Wedbush did not express any view as to the reasonableness of such financial information or the assumptions on which it was based.

Wedbush further relied on the assurances of Mirna's management that they were not aware of any facts that would make the information provided to Wedbush incomplete or misleading. Except for certain estimates of liabilities expected to be incurred by Mirna in connection with a potential liquidation of Mirna prepared by

management of Mirna, Wedbush did not make and was not provided with any independent evaluations or appraisals of any of the assets, properties, liabilities (including any contingent, derivative or off-balance-sheet assets or liabilities) or securities, nor did Wedbush make any physical inspection of the properties or assets, of Mirna or Synlogic. Further, as the Mirna Board of Directors was aware, Synlogic's management did not provide Wedbush with, and Wedbush did not otherwise have access to, financial forecasts regarding Synlogic's business, other than certain collaboration revenue and operating expense forecasts for the three years ended December 31, 2019, and, accordingly, Wedbush did not perform either a discounted cash flow analysis or any multiples-based analyses with respect to Synlogic. With respect to the operating expense forecasts of Synlogic, upon the guidance of the managements of Mirna and Synlogic, Wedbush assumed that such projections had been reasonably prepared on a basis reflecting the best currently available estimates and judgments of the management of Synlogic as to the future operating expenses of Synlogic and that Synlogic will perform substantially in accordance with such projections. Wedbush further assumed no responsibility for and expressed no view as to any such projections or the assumptions on which they are based. Wedbush did not evaluate the solvency or fair value of Mirna, Synlogic, or any of their respective subsidiaries (or the impact of the transactions contemplated by the Merger Agreement thereon) under any law relating to bankruptcy, insolvency or similar matters.

Wedbush's opinion was based on economic, market and other conditions as the same may have existed on, and the information made available to Wedbush as of, the date of such opinion. Wedbush also relied, without independent verification, on the accuracy and completeness of Mirna's and Synlogic's representations and warranties in the draft Merger Agreement, without regard to any qualifications or exceptions that may be set forth in disclosure schedules, and the information provided to Wedbush by Mirna and Synlogic. In addition, Wedbush assumed that the Merger would be consummated in accordance with the terms set forth in the draft Merger Agreement without any waiver, amendment or delay of any terms or conditions that would be material to Wedbush's analysis. Representatives of Mirna advised Wedbush that, and Wedbush further assumed that, the final terms of the Merger Agreement would not differ from the terms set forth in the draft Merger Agreement reviewed by Wedbush in any respect material to Wedbush's analysis. Wedbush also assumed that all governmental, regulatory or other consents and approvals necessary for the consummation of the Merger would be obtained without imposition of any terms or conditions that would be material to Wedbush's analysis. Wedbush noted that events occurring after the date of its opinion could materially affect the assumptions used in preparing its opinion. Wedbush did not undertake any obligation to reaffirm or revise its opinion or otherwise comment upon any events occurring after the date of such opinion.

Wedbush is not a legal, tax or regulatory advisor, and did not express any opinion as to any tax or other consequences that may arise from the transactions contemplated by the Merger Agreement, nor does its opinion address any legal, regulatory or accounting matters, as to which Wedbush understood that Mirna had obtained such advice as it deemed necessary from qualified professionals. Wedbush is a financial advisor only and relied upon, without independent verification, the assessment of Mirna and Synlogic and their legal, tax or regulatory advisors with respect to legal, tax or regulatory matters. Wedbush assumed that the Merger will have the tax effects contemplated by the Merger Agreement.

Wedbush is an investment banking firm and a member of The New York Stock Exchange and other principal stock exchanges in the United States, and is regularly engaged as part of its business in the valuation of businesses and their securities in connection with mergers and acquisitions, negotiated underwritings, private placements, secondary distributions of listed and unlisted securities, and valuations for corporate, estate and other purposes. Wedbush was selected by Mirna based on Wedbush's experience, expertise, reputation and familiarity with Mirna. The Mirna Board of Directors did not impose any limitations on Wedbush with respect to the investigations made or procedures followed in rendering its opinion. Wedbush's opinion was approved by a fairness committee at Wedbush in accordance with the requirements of FINRA Rule 5150.

In rendering its opinion, Wedbush expressed no opinion as to the amount or nature of any compensation to any officers, directors, or employees of Mirna, or any class of such persons, whether relative to the consideration to be paid in the Merger or otherwise, or with respect to the fairness of any such compensation.

Wedbush was not asked to, nor did it, offer any opinion as to the terms, other than the consideration to be paid by Mirna to the extent expressly set forth in Wedbush's opinion, of the Merger Agreement or the form of the Merger. Wedbush did not express any opinion with respect to the terms of any other agreement entered into or to be entered into in connection with the Merger. Wedbush expressed no opinion as to the price at which shares of Mirna Common Stock may trade at any time subsequent to the announcement or consummation of the Merger.

Mirna paid Wedbush a $50,000 retainer upon execution of its engagement letter and agreed to pay Wedbush a fee of $500,000 for rendering its opinion, which became payable upon the delivery of Wedbush's opinion. Mirna has also agreed to pay Wedbush an additional fee of $1.5 million, contingent upon closing of the Merger and against which the $50,000 retainer and $500,000 opinion fee will be credited. In addition, Mirna agreed to indemnify Wedbush for certain liabilities arising out of its engagement and agreed to reimburse Wedbush for its expenses, including attorney's fees and disbursements. In the two years prior to the date of its opinion, Wedbush had not provided any services to Mirna or Synlogic. Wedbush may in the future provide investment banking and financial advisory services to Mirna, Synlogic and their respective affiliates for which services Wedbush would expect to receive customary fees.

In the ordinary course of its business, Wedbush and its affiliates may actively trade Mirna Common Stock or other instruments or obligations of Mirna for their own accounts and for the accounts of their customers and, accordingly, Wedbush and its affiliates may at any time hold a long or short position in Mirna Common Stock or such other instruments or obligations of Mirna. On November 23, 2016, the date Mirna formally engaged Wedbush, and on May 15, 2017, the date Wedbush delivered its written opinion to the Mirna Board of Directors, Wedbush and its affiliates did not hold an equity ownership position in Mirna.

Summary of Analyses

The following is a summary of the material financial analyses performed by Wedbush in connection with reaching its opinion:

- Public Market Equity Value Analysis with respect to Mirna;
- Public Company Market Valuation Analysis with respect to Synlogic;
- Precedent Merger and Acquisition Transaction Analysis with respect to Synlogic; and
- Precedent Initial Public Offering Analysis with respect to Synlogic.

The following summaries are not a comprehensive description of Wedbush's opinion or the analyses and examinations conducted by Wedbush, and the preparation of an opinion necessarily is not susceptible to partial analysis or summary description. Wedbush believes that such analyses and the following summaries must be considered as a whole and that selecting portions of such analyses and of the factors considered, without considering all such analyses and factors, would create an incomplete view of the process underlying the analyses. The order in which the analyses are described below does not represent the relative importance or weight given to the analyses by Wedbush. Some of the summaries of financial analyses below include information presented in tabular format. In order to fully understand the analyses, the tables must be read together with the text of each summary. The tables alone do not constitute a complete description of Wedbush's analyses. Considering the data described below without considering the full narrative description of the financial analyses, including the methodologies and assumptions underlying the analyses, could create a misleading or incomplete view of the analyses.

Additionally, the relative percentage ownership of the combined company was derived using respective stipulated values of Synlogic of approximately $222.0 million (comprised of a $180.0 million valuation and a $42.0 million concurrent private placement) and Mirna of approximately $45.0 million. These amounts were negotiated by the parties as the respective valuations of each party and are not specifically set forth in the Merger

Agreement. For purposes of Wedbush's opinion, Mirna's management advised Wedbush, and Wedbush assumed without independent verification that (i) Mirna's net cash would be $40.0 million as of immediately prior to the Closing of the Merger, (ii) the percentage ownership interest of Mirna Stockholders after giving effect to the Merger would be 16.9% and (iii) the percentage ownership interest of Synlogic Stockholders after giving effect to the Merger would be 83.1%. Wedbush expressly disclaimed any opinion as to (a) the reasonableness of these assumptions, (b) the amount of Mirna's net cash immediately prior to Closing of the Merger, (c) the final Exchange Ratio determined pursuant to the Merger Agreement, (d) the final percentage ownership interest of Mirna Stockholders after giving effect to the Merger, (e) the final percentage ownership interest of Synlogic Stockholders after giving effect to the Merger, or (f) the actual number of shares of Mirna Common Stock to be issued in the Merger.

The data described below assumes that the relative percentage ownership of the combined company following the consummation of the Merger will be 83.1% by the Synlogic Stockholders and 16.9% by the Mirna Stockholders.

In performing its analyses, Wedbush made numerous assumptions with respect to industry performance and general business and economic conditions such as industry growth, inflation, interest rates and many other matters, many of which are beyond the control of Mirna, Synlogic and Wedbush. Any estimates contained in Wedbush's analyses are not necessarily indicative of actual values or future results, which may be significantly more or less favorable than suggested by such analyses.

Wedbush noted that it was Mirna's management's view that a discounted cash flow analysis was not an appropriate method of valuing Mirna because Mirna had ceased all product research and development and therefore did not have any anticipated future revenues to form a basis for such an analysis. Accordingly, Wedbush did not conduct a discounted cash flow analysis and instead relied on the other analyses described herein.

Wedbush did not perform a discounted cash flow analysis or any multiples-based analyses for Synlogic because Synlogic would not have recurring product revenues unless its product candidates were approved for marketing by the FDA, which would require the successful completion of future Phase 1, Phase 2 and Phase 3 trials. Further, Wedbush believed that such analyses were not appropriate because Synlogic is a preclinical company with no approved or marketed products and because Wedbush was not provided, and Wedbush did not otherwise have access to, financial forecasts regarding Synlogic's business, other than certain collaboration revenue and operating expense forecasts for the three years ending December 31, 2019.

Except as otherwise noted, the following quantitative information, to the extent that it is based on market data, is based on market data as it existed on or before May 15, 2017 and is not necessarily indicative of current market conditions.

Public Market Equity Value Analysis—Mirna

Using publicly available information, Wedbush noted that the volume weighted average trading price for the Mirna Common Stock was $2.00 per share on May 15, 2017, $1.98 per share for the seven-day period ended May 15, 2017 and $2.07 per share for the 30-day period ended May 15, 2017. Based upon these volume weighted average trading prices for the Mirna Common Stock and the number of fully diluted outstanding shares of Mirna Common Stock as provided by management of Mirna, Wedbush calculated Mirna's equity value as approximately $41.8 million to $43.1 million.

Public Company Market Valuation Analysis—Synlogic

Wedbush reviewed publicly available information relating to the following publicly-traded companies with an aggregate market capitalization between $100.0 million, equal to the fully diluted pre-money valuation of

Synlogic's Series B financing, and $1.0 billion in the biopharmaceutical industry with preclinical or Phase 1 product candidates (and no product candidates beyond Phase 1 or Phase 1/2) that as of May 15, 2017 did not have human data (the "Phase 1 Companies"), which criteria were applied to select for companies similar to Synlogic:

- Jounce Therapeutics, Inc.;
- Editas Medicine, Inc.;
- CRISPR Therapeutics AG;
- WAVE Life Sciences Ltd.;
- Regenxbio Inc.;
- Intellia Therapeutics Inc.;
- CytomX Therapeutics, Inc.; and
- Audentes Therapeutics, Inc.

Wedbush noted that, although such companies had certain financial and operating characteristics that could be considered similar to those of Synlogic, none of the companies had the same management, make-up, regulatory outlook, technology, or size or mix of business as Synlogic and, accordingly, there were inherent limitations on the applicability of such companies to the valuation analysis of Synlogic. For purposes of this analysis, Wedbush assumed that Synlogic had completed a $42.0 million equity private placement prior to signing the Merger Agreement.

Wedbush calculated the equity value of each of the selected companies by multiplying the number of fully-diluted shares outstanding using the treasury stock method, which (i) includes the conversion of all outstanding in-the-money warrants, options and convertible preferred stock into common stock and (ii) excludes any other shares reserved for issuance pursuant to employee stock incentive plans, employee stock option plans, by the closing price of the common stock of each selected company on May 15, 2017. The results of this analysis are summarized as follows:

	Market Capitalization at May 15, 2017 ($ in millions)
	Phase 1 Companies
Mean	$ 645.4
Median	$ 608.5

Wedbush calculated the implied ownership of Mirna Stockholders in the combined company based upon the approximate $45.0 million value attributed to the Mirna Common Stock and the approximate $222.0 million value attributed to the Synlogic Common Stock pursuant to the Merger, and the mean and median values described above.

The results of this analysis are summarized as follows:

	Public Company Market Valuation Analysis	
	Equity Value ($ in millions)	Ownership
Synlogic Equity Value per agreement of both parties	$ 222.0	83%
Mirna Equity Value per agreement of both parties	$ 45.0	17%
Aggregate Value per Agreement	**$ 267.0**	**100%**

	Mean		Median	
	Equity Value ($ in millions)	Ownership	Equity Value ($ in millions)	Ownership
Synlogic Equity Value per Public Company Analysis	$ 645.4	93%	$ 608.5	93%
Mirna Equity Value per agreement of both parties	$ 45.0	7%	$ 45.0	7%
Implied Aggregate Value	**$ 690.4**	**100%**	**$ 653.5**	**100%**

Wedbush noted that the implied ownership percentage of Mirna Stockholders based upon the approximate $45.0 million value attributed to the Mirna Common Stock and the approximate $222.0 million value attributed to the Synlogic Common Stock pursuant to the Merger was higher than the implied ownership percentages derived based upon the mean and median equity values attributed to Synlogic described above.

Precedent Merger and Acquisition Transaction Analysis—Synlogic

Wedbush reviewed publicly available information relating to the following acquisitions of private companies in the biopharmaceutical industry considered by Wedbush to be similar to Synlogic, which had preclinical or Phase 1 product candidates (and no product candidates beyond Phase 1 or Phase 1/2) with no human data at the time of announcement of the transaction, with an aggregate valuation of between $100.0 million, equal to the fully diluted pre-money valuation of Synlogic's Series B financing, and $1.0 billion (which included any future contingent payments) and announced between January 2015 and May 2017 (the "Selected Transactions"):

Announcement Date	Target	Acquiror
January 26, 2017	Delinia, Inc.	Celgene
August 1, 2016	Bamboo Therapeutics	Pfizer
July 5, 2016	Cormorant Pharmaceuticals	Bristol-Myers Squibb
March 23, 2016	Padlock Therapeutics	Bristol-Myers Squibb
October 21, 2015	Admune Therapeutics	Novartis AG
July 28, 2015	cCAM Biotherapeutics	Merck & Co.

Wedbush noted that although the companies that were acquired in the Selected Transactions had certain financial and operating characteristics that could be considered similar to those of Synlogic, none of such companies had the same management, make-up, regulatory outlook, technology, or size or mix of business as Synlogic and, accordingly, there were inherent limitations on the applicability of these Selected Transactions to the valuation analysis of Synlogic. Wedbush also noted that market conditions have varied significantly over the precedent time period.

Wedbush calculated the total transaction equity consideration payable to target equityholders in the Selected Transactions (which included the sum of upfront payments and any future contingent payments at the time of announcement). The results of this analysis are summarized as follows:

	Valuation ($ in millions)
Mean	$ 574.3
Median	$ 602.5

Wedbush calculated the implied ownership of Mirna Stockholders in the combined company based upon the approximate $45.0 million value attributed to the Mirna Common Stock and the approximate $222.0 million value attributed to the Synlogic Common Stock pursuant to the Merger, and the mean and median values described above.

The results of this analysis are summarized as follows:

	Merger and Acquisition Transaction Analysis	
	Equity Value	Ownership
Synlogic Equity Value per agreement of both parties	$ 222.0	83%
Mirna Equity Value per agreement of both parties	$ 45.0	17%
Aggregate Value per Agreement	**$ 267.0**	**100%**

	Mean		Median	
	Equity Value ($ in millions)	Ownership	Equity Value ($ in millions)	Ownership
Synlogic Equity Value per Precedent Merger and Acquisition Transaction Analysis	$ 574.3	93%	$ 602.5	93%
Mirna Equity Value per agreement of both parties	$ 45.0	7%	$ 45.0	7%
Implied Aggregate Value	**$ 619.3**	**100%**	**$ 647.5**	**100%**

Wedbush noted that the implied ownership percentage of Mirna Stockholders based upon the approximate $45.0 million value attributed to the Mirna Common Stock and the approximate $222.0 million value attributed to the Synlogic Common Stock pursuant to the Merger was higher than the implied ownership percentages derived based upon the mean and median equity values attributed to Synlogic described above.

Precedent Initial Public Offering Analysis—Synlogic

Wedbush reviewed publicly available information relating to the following initial public offerings of companies in the biopharmaceutical industry considered by Wedbush to be similar to Synlogic, which had preclinical or Phase 1 product candidates (and no product candidates beyond Phase 1 or Phase 1/2) with no human data at the time of the initial public offering, with pre-money valuations greater than $100.0 million, equal to the fully diluted pre-money valuation of Synlogic's Series B financing, and which raised a minimum of $40.0 million in gross proceeds, equal to the anticipated cash balance of Mirna at the close of the Merger and which priced between January 2015 and November 2016 (the "Phase 1 IPOs"), which criteria were applied to select for companies similar to Synlogic:

Pricing Date	Issuer
January 26, 2017	Jounce Therapeutics, Inc.
October 18, 2016	CRISPR Therapeutics AG
July 19, 2016	Audentes Therapeutics, Inc.
May 5, 2016	Intellia Therapeutics Inc.
February 10, 2016	Proteostasis Therapeutics, Inc.
February 2, 2016	Editas Medicine, Inc.
November 10, 2015	WAVE Life Sciences Ltd.
October 7, 2015	CytomX Therapeutics, Inc.
September 16, 2015	Regenxbio Inc.
April 29, 2015	Blueprint Medicines Corporation
April 14, 2015	Cidara Therapeutics, Inc.

Wedbush noted that although such companies had certain financial and operating characteristics that could be considered similar to those of Synlogic, none of the companies had the same management, make-up,

regulatory outlook, technology or size or mix of business as Synlogic and, accordingly, there were inherent limitations on the applicability of these Phase 1 IPOs to the valuation analysis of Synlogic. Wedbush also noted that market conditions have varied significantly over the precedent time period.

Wedbush calculated the fully diluted pre-money valuation (excluding any gross proceeds received in the initial public offering and gross proceeds from concurrent private placements) of the issuer in each of the Phase 1 IPOs at the time of pricing of its initial public offering using the treasury stock method. The results of this analysis are summarized as follows:

	Pre-Money Valuation ($ in millions) Phase 1 IPOs
Mean	$ 350.2
Median	$ 345.4

Wedbush calculated the implied ownership of Mirna Stockholders in the combined company based upon the approximate $45.0 million value attributed to the Mirna Common Stock and the approximate $222.0 million value attributed to the Synlogic Common Stock pursuant to the Merger, and the mean and median values described above.

The results of this analysis are summarized as follows:

	Initial Public Offering Analysis	
	Equity Value	Ownership
Synlogic Equity Value per agreement of both parties	$ 222.0	83%
Mirna Equity Value per agreement of both parties	$ 45.0	17%
Aggregate Value per Agreement	**$ 267.0**	**100%**

	Mean		Median	
	Equity Value ($ in millions)	Ownership	Equity Value ($ in millions)	Ownership
Synlogic Equity Value per Precedent Initial Public Offering Analysis	$ 350.2	89%	$ 345.4	88%
Mirna Equity Value per agreement of both parties	$ 45.0	11%	$ 45.0	12%
Implied Aggregate Value	**$ 395.2**	**100%**	**$ 390.4**	**100%**

Wedbush noted that the implied ownership percentage of Mirna Stockholders based upon the approximate $45.0 million value attributed to the Mirna Common Stock and the approximate $222.0 million value attributed to the Synlogic Common Stock pursuant to the Merger was higher than the implied ownership percentages derived based upon the mean and median equity values attributed to Synlogic described above.

Miscellaneous

This summary is not a complete description of Wedbush's opinion or the underlying analyses and factors considered in connection with Wedbush's opinion. The preparation of a fairness opinion is a complex process involving the application of subjective business and financial judgment in determining the most appropriate and relevant methods of financial analysis and the application of those methods to the particular circumstances and, therefore, is not readily susceptible to partial analysis or summary description. Wedbush believes that its analyses described above must be considered as a whole and that considering any portion of such analyses and of the factors considered without considering all analyses and factors could create a misleading view of the process underlying its opinion. Selecting portions of the analyses or summary set forth above, without considering the

analyses as a whole, could create an incomplete view of the processes underlying the Wedbush opinion. In arriving at its fairness determination, Wedbush considered the results of all of its analyses and did not attribute any particular weight to any factor or analysis. Rather, it made its fairness determination on the basis of its experience and professional judgment after considering the results of all of its analyses. No company or transaction in the analyses described above is identical to Mirna, Synlogic or the Merger.

In conducting its analyses and arriving at its opinion, Wedbush utilized a variety of valuation methods. The analyses were prepared solely for the purpose of enabling Wedbush to provide its opinion to the Mirna Board of Directors as to the fairness, from a financial point of view, to the Mirna Stockholders of the consideration to be paid by Mirna in the Merger, as of the date of the opinion, and do not purport to be an appraisal or necessarily reflect the prices at which businesses or securities actually may be sold, which are inherently subject to uncertainty.

The terms of the Merger were determined through arm's-length negotiations between Mirna and Synlogic and were approved by the Mirna Board of Directors. Although Wedbush provided advice to the Mirna Board of Directors during the course of these negotiations, the decision to enter into the Merger Agreement was solely that of the Mirna Board of Directors. Wedbush did not recommend any specific consideration to Mirna or the Mirna Board of Directors, or that any specific amount or type of consideration constituted the only appropriate consideration for the Merger. As described above, the opinion of Wedbush and its presentation to the Mirna Board of Directors were among a number of factors taken into consideration by the Mirna Board of Directors in making its determination to approve the Merger Agreement, the Merger and the other transactions contemplated by the Merger Agreement.

Interests of the Mirna Directors and Executive Officers in the Merger

In considering the recommendation of the Mirna Board of Directors with respect to issuing shares of Mirna Common Stock as contemplated by the Merger Agreement and the other matters to be acted upon by the Mirna Stockholders at the Annual Meeting, the Mirna Stockholders should be aware that certain members of the Mirna Board of Directors and executive officers of Mirna have interests in the Merger that may be different from, or in addition to, the interests of the Mirna Stockholders. These interests relate to or arise from, among other things:

- severance benefits to which each of Mirna's executive officers would become entitled in the event of a change of control of Mirna and/or his or her covered termination of employment within 12 months following the consummation of the Merger;
- the accelerated vesting of Mirna Options held by Mirna's executive officers and board members in connection with the consummation of the Merger and/or his or her covered termination of employment within 12 months following the consummation of the Merger; and
- the agreement that two of Mirna's directors will serve on the board of directors of the combined organization following the consummation of the Merger.

The board of directors of each of Mirna and Synlogic was aware of these potential conflicts of interest and considered them, among other matters, in reaching their respective decisions to approve the Merger Agreement and the Merger, and to recommend, as applicable, that the Mirna Stockholders approve the proposals to be presented to the Mirna Stockholders for consideration at the Annual Meeting as contemplated by this proxy statement/prospectus/information statement, and that the Synlogic Stockholders sign and return the written consent as contemplated by this proxy statement/prospectus/information statement.

Although Vincent O'Neill, M.D., Miguel Barbosa, Ph.D. and Jon Irvin (collectively, the "Former Executive Officers") are no longer executive officers of Mirna due to their ceasing employment in May 2017, June 2016 and December 2016, respectively, included in this section is information with respect to Drs. O'Neill and Barbosa and Mr. Irvin because they were executive officers during 2016 and, in the case of Dr. O'Neill, 2017.

Ownership Interests

As of May 31, 2017, all directors and current executive officers of Mirna, together with all former named executive officers who were named executive officers during Mirna's fiscal year ending December 31, 2016, beneficially owned approximately 39% of the outstanding shares of Mirna Common Stock. The affirmative vote of the holders of a majority of the shares of Mirna Common Stock having voting power present in person or represented by proxy at the Annual Meeting is required for approval of Proposal Nos. 1, 4, 5 and 6. The affirmative vote of the holders of a majority of shares of Mirna Common Stock having voting power outstanding on the Record Date for the Annual Meeting is required for approval of Proposal Nos. 2 and 3. Certain of Mirna's officers and directors, and their affiliates, have also entered into support agreements in connection with the Merger. For a more detailed discussion of the support agreements see the section entitled "*Agreements Related to the Merger—Support Agreements and Written Consents*" in this proxy statement/prospectus/information statement.

Mirna Options

As of May 31, 2017, Mirna's directors and current executive officers, together with all former named executive officers who were named executive officers during Mirna's fiscal year ending December 31, 2016, collectively owned unvested Mirna Options covering 589,016 shares of Mirna Common Stock and vested Mirna Options covering 877,969 shares of Mirna Common Stock.

Prior to the Closing, the Mirna Board of Directors will adopt appropriate resolutions and take all other actions necessary and appropriate to provide that each outstanding and unexercised Mirna Option, whether vested or unvested, will be accelerated in full effective as of immediately prior to the Effective Time. Effective as of the Effective Time, each outstanding and unexercised Mirna Option having an exercise price per share less than the Mirna Closing Price will be automatically exercised in full and, in exchange therefor, each former holder of any such automatically exercised Mirna Options will be entitled to receive a number of shares of Mirna Common Stock calculated by dividing (a) the product of (i) the total number of shares of Mirna Common Stock previously subject to such Mirna Option, and (ii) the excess of the Mirna Closing Price over the exercise price per share of the Mirna Common Stock previously subject to such Mirna Option by (b) the Mirna Closing Price. Each outstanding and unexercised Mirna Option that has an exercise price equal to or greater than the Mirna Closing Price will be terminated and cease to exist as of immediately prior to the Effective Time for no consideration and the shares of Mirna Common Stock underlying the unexercised Mirna Options will be returned to the Mirna 2015 Plan.

The following table presents certain information concerning the outstanding Mirna Options held by Mirna's directors and current executive officers, together with all former named executive officers who were named executive officers during Mirna's fiscal year ending December 31, 2016, as of May 31, 2017.

	Option Awards				
Name	Number of Shares of Mirna Common Stock Underlying Unexercised Options (#) Exercisable	Number of Shares of Mirna Common Stock Underlying Unexercised Options (#) Unexercisable	Vesting Commencement Date(1)	Option Exercise Price ($)	Option Expiration Date
Current Executive Officers					
Paul Lammers, M.D., M.Sc.	10,565	—	— (2)	$ 7.50	12/31/2019
	116,211	—	— (2)	1.65	1/10/2023
	57,195	15,051	3/6/2014	8.10	3/10/2024
	11,666	8,333	1/1/2015	6.15	3/1/2025
	68,576	63,090	5/1/2015(3)	6.45	6/4/2025

Name	Option Awards				
	Number of Shares of Mirna Common Stock Underlying Unexercised Options (#) Exercisable	Number of Shares of Mirna Common Stock Underlying Unexercised Options (#) Unexercisable	Vesting Commencement Date(1)	Option Exercise Price ($)	Option Expiration Date
	31,944	44,722	9/30/2015	7.00	9/30/2025
	48,125	116,875	3/11/2016(3)	4.36	3/11/2026
Alan Fuhrman	69,657	97,523	9/30/2016	7.00	9/30/2025
	17,500	42,500	3/11/2016	4.36	3/11/2026
Casi DeYoung	38,983	10,259	3/6/2014	8.10	3/10/2024
	388	278	1/1/2015	6.15	3/1/2025
	4,989	4,590	5/1/2015	6.45	6/4/2025
	11,111	15,555	9/30/2025	7.00	9/30/2025
	17,500	42,500	3/11/2026	4.36	3/11/2026
Former Executive Officers					
Vincent O'Neill, M.D.	250,000	—	— (2)	4.42	8/24/2017
Miguel Barbosa, Ph.D.	—	—	—	—	—
Jon Irvin	6,563	—	— (2)	1.65	6/6/2023
	13,795	—	— (2)	4.35	12/30/2023
	14,113	—	— (2)	8.10	3/10/2024
	2,666	—	— (2)	6.15	3/1/2025
	9,580	—	— (2)	6.45	6/4/2025
	25,000	—	— (2)	7.00	9/30/2025
	10,000	—	— (2)	4.36	3/11/2026
Directors					
Lawrence M. Alleva	9,333	4,000	9/10/2014(4)	7.80	11/5/2024
	1,600	1,066	1/1/2015(4)	6.15	3/1/2025
	4,800	3,200	5/1/2015(4)	6.45	6/5/2025
	3,511	7,022	9/30/2015(5)	7.00	9/30/2025
	—	10,000	6/29/2016(6)	4.74	6/29/2026
Peter S. Greenleaf	4,000	8,000	3/1/2016(5)	6.45	3/1/20026
	2,667	5,333	3/11/2016(5)	7.00	3/11/2026
	—	10,000	6/29/2016(6)	4.74	6/29/2026
Edward Mathers	2,400	1,600	5/1/2015(4)	6.45	6/5/2025
	2,400	4,800	9/30/2015(5)	7.00	9/30/2025
	—	10,000	6/29/2016(6)	4.74	6/29/2026
Perry Nisen, M.D., Ph.D.	—	20,000	6/29/2016(5)	4.74	6/29/2026
Michael Powell, Ph.D.	4,000	2,666	5/1/2015(4)	6.45	6/5/2025
	2,400	4,800	9/30/2015(5)	7.00	9/30/2025
	—	10,000	6/29/2016(6)	4.74	6/29/2026

Name	Option Awards				
	Number of Shares of Mirna Common Stock Underlying Unexercised Options (#) Exercisable	Number of Shares of Mirna Common Stock Underlying Unexercised Options (#) Unexercisable	Vesting Commencement Date(1)	Option Exercise Price ($)	Option Expiration Date
Matthew Winkler, Ph.D.	2,400	1,600	5/1/2015(4)	6.45	6/5/2025
	2,400	4,800	9/30/2015(5)	7.00	9/30/2025
	—	10,000	6/29/2016(6)	4.74	6/29/2026

(1) Except as otherwise noted, the shares subject to the options shall vest and become exercisable as to 1/4th of the shares subject to the option on the first anniversary of the vesting commencement date, and thereafter as to 1/48th of the shares subject to such option on each monthly anniversary of the vesting commencement date, such that all shares are subject to the option will be vested on the fourth anniversary of the vesting commencement date, subject to the holder continuing to provide services to Mirna through such vesting date.

(2) The options are fully vested.

(3) The shares subject to the option vest and become exercisable as to the 1/48th of the shares subject to such option on each monthly anniversary of the vesting commencement date, such that all shares subject to the option will be vested on the fourth anniversary of the vesting commencement date, subject to the holder continuing to provide services to Mirna through such vesting date.

(4) 20% of the shares were fully vested and exercisable as of the date of grant and 10% of the shares subject to the option shall vest every six-month anniversary of the vesting commencement date, such that all shares subject to the option will be vested on the fourth anniversary of the vesting commencement date, subject to the holder continuing to provide services to Mirna through such vesting date.

(5) 1/3 of the shares subject to the option shall vest on each annual anniversary of the vesting commencement date.

(6) 100% of the total number of shares subject to the option set forth above shall vest and become exercisable on the earlier of the first anniversary of the grant date or the date of the next annual stockholders meeting after the grant date.

Accelerated Vesting of Mirna Options

The Mirna 2015 Plan provides that, in the event that, within the 12-month period immediately following a change in control, a holder of outstanding awards experiences a termination of service by Mirna other than for "cause" or by the holder for "good reason," then the vesting and, if applicable, exercisability of outstanding awards held by such holder will accelerate in full upon the date of such termination of service. The definitions of "cause" and "good reason" are consistent with the definitions of "cause" and "constructive termination" below with respect to the Change of Control Severance Agreements.

Mirna also maintains a Non-Employee Director Compensation Program pursuant to which non-employee directors may receive Mirna Options. Pursuant to the terms of the Non-Employee Director Compensation Program, all equity awards outstanding and held by a non-employee director will vest in full immediately prior to the occurrence of a change in control.

Change in Control Severance Agreements

Mirna has entered into Change in Control Severance Agreements with each of its currently employed executive officers, Paul Lammers, M.D., M. Sc., Alan Fuhrman and Casi DeYoung (collectively, the "Current Executive Officers"), that provide for severance payments and benefits upon certain qualifying terminations of employment. Pursuant to the terms of the Change in Control Severance Agreements, in the event the executive's

employment is terminated by Mirna other than for "cause" or the executive experiences a "constructive termination" (each as defined below), then the executive will receive as severance nine months (or 12 months in the case of Dr. Lammers) of base salary in a single cash lump sum payment and up to nine months (or 12 months in the case of Dr. Lammers) of healthcare continuation coverage premium reimbursement; provided, that if the termination or resignation occurs within the period commencing on a "change in control" (as defined in the Change in Control Severance Agreements, including the Merger) and ending 12 months after a change in control, the severance will consist of 12 months (or 18 months in the case of Dr. Lammers) of base salary paid in a single cash lump sum, 100% (or 150% in the case of Dr. Lammers) of the executive's target bonus paid in a single cash lump sum, up to 12 months (or 18 months in the case of Dr. Lammers) of healthcare continuation coverage premium reimbursement and full vesting acceleration for each Mirna Option and other equity award held by the executive at the time of such termination. The executive must timely deliver an effective release of claims to Mirna in order to be eligible for the foregoing severance benefits.

For purposes of the Change in Control Severance Agreements, "cause" means (i) the conviction of the executive officer by a court of competent jurisdiction of a crime involving moral turpitude; (ii) the commission, or attempted commission, by the executive officer of an act of fraud on Mirna; (iii) the misappropriation, or attempted misappropriation, by the executive officer of any of Mirna's funds or property; (iv) the failure by the executive officer to perform in any material respect his or her obligations under the terms of his or her agreement, which such failure has gone unremedied within 10 days after Mirna provides the executive officer with written notice of such failure; (v) the knowing engagement by the executive officer, without the written approval of the Mirna Board of Directors, in any direct, material conflict of interest with Mirna without compliance with Mirna's conflict of interest policy; (vi) the knowing engagement by the executive officer, without written approval of the Mirna Board of Directors, in any activity which competes with Mirna's business or which would result in a material injury to Mirna or which otherwise violates any provision of his or her agreement, employment agreement or any confidentiality agreement; or (vii) the knowing engagement by the executive officer in any activity that would constitute a material violation of the provisions of Mirna's business ethics policy, employee handbook or similar policies, if any, then in effect.

For purposes of the change in Change in Control Severance Agreements, "constructive termination" means the executive officer's resignation from all positions he or she then holds with Mirna if: (i) without the executive officer's prior written consent, (a) there is a material diminution in his or her duties and responsibilities with Mirna; provided, however, that a change in title or reporting relationship will not be a constructive termination; (b) there is a material reduction of the executive officer's then-existing base salary; provided, however, that a material reduction in his or her base salary pursuant to a salary reduction program affecting all or substantially all of Mirna's employees and that does not adversely affect the executive officer to a greater extent than other similarly situated employees will not be a constructive termination; or (c) the executive officer is required to relocate his or her primary work location to a facility or location that would increase his or her one-way commute distance by more than 50 miles from his or her primary work location as of immediately prior to such change, (ii) the executive officer provides written notice outlining such conditions, acts or omissions to Mirna within 30 days immediately following such material change or reduction, (iii) such material change or reduction is not remedied by Mirna within 30 days following Mirna's receipt of such written notice and (iv) the executive officer's resignation is effective not later than 30 days after the expiration of such 30 day cure period.

O'Neill Separation Agreement

Dr. O'Neill resigned his employment effective May 19, 2017 and entered into a Separation Agreement with Mirna effective as of May 26, 2017. The Separation Agreement superseded all other prior agreements between Dr. O'Neill and Mirna. Pursuant to the Separation Agreement, Mirna paid Dr. O'Neill an aggregate separation payment of $459,000 (less applicable withholdings and taxes), which represents the sum of 12 months of Dr. O'Neill's base salary plus his target annual bonus assuming achievement of his performance goals at target. Dr. O'Neill will also receive the payment of continued health, dental and vision insurance premiums for himself for up to 12 months and 100% vesting acceleration on his outstanding Mirna Options. The Separation Agreement also included a general release of all claims against Mirna.

Barbosa Separation Agreement

Dr. Barbosa resigned his employment effective June 29, 2016, and entered into a Separation Agreement with Mirna on June 29, 2016. The Separation Agreement superseded all other prior agreements between Dr. Barbosa and Mirna. In 2016, pursuant to the Separation Agreement, Mirna paid Dr. Barbosa an aggregate separation payment of $270,375 (less applicable withholdings and taxes), which, consistent with the severance benefits provided under Dr. Barbosa's Change in Control Severance Agreement for a termination not in connection with a change in control, represented nine months of his base salary, in exchange for a general release of all claims against Mirna. Dr. Barbosa also received the payment of continued health, dental and vision insurance premiums for himself for up to nine months.

Irvin Separation Agreement

Mr. Irvin resigned his employment effective December 2, 2016, and entered into a Separation Agreement with Mirna on December 2, 2016. The Separation Agreement superseded all other prior agreements between Mr. Irvin and Mirna and provided for Mr. Irvin to receive as severance $315,900 (less applicable withholdings and taxes), which constituted 12 months of his base salary and 100% of his target bonus opportunity. The Separation Agreement also provided for the full acceleration of vesting for all Mirna Options held by Mr. Irvin on his termination date as well as the payment of continued health, dental and vision insurance premiums for himself for up to 12 months. The Separation Agreement also included a general release of all claims against Mirna.

Potential Payments upon Termination

The following table sets forth the information required by Item 402(t) of Regulation S-K regarding certain compensation which each of Mirna's "named executive officers" may receive that is based on or that otherwise relates to the Merger. This compensation is referred to as "golden parachute" compensation in Item 402(t) of Regulation S-K. For additional details regarding the terms of the payments quantified below, see *"—Interests of the Mirna Directors and Executive Officers in the Merger"* above. Note that while Drs. O'Neill and Barbosa and Mr. Irvin are included in the table below as required by Item 402(t) of Regulation S-K, they no longer serve as executive officers of Mirna.

The amounts indicated below are estimates based on multiple assumptions that may or may not actually occur or be accurate on the relevant date, including the assumptions described below. The actual value to be received by Mirna's named executive officers may be greater or less than the amounts presented below. For purposes of calculating such amounts, Mirna has assumed, among other things:

- August 15, 2017 as the closing date of the Merger;
- $1.42 as the closing price of a share of Mirna Common Stock on the closing date of the Merger; and
- the termination of Mirna's Current Executive Officers' employment by Mirna without "cause" or by the executive as the result of a "constructive termination" (each as defined in the applicable Change in Control Severance Agreement) immediately following the Closing.

"Golden Parachute" Compensation

Name	Cash ($)(1)	Equity ($)(2)	Perquisites/ Benefits ($)(3)	Total ($)
Paul Lammers, M.D., M. Sc.	$933,750	—	$ 25,938	$959,688
Alan Fuhrman	$451,980	—	$ 17,292	$469,272
Vincent O'Neill, M.D.(4)	$459,000	—	$ 5,436	$464,436
Miguel Barbosa, Ph.D.(5)	—	—	—	—
Jon Irvin(6)	—	—	—	—

(1) With respect to Dr. Lammers and Mr. Fuhrman, represents cash severance paid with respect to the executive's Change of Control Severance Agreement, as further described above under "*—Interests of the*

Mirna Directors and Executive Officers in the Merger," in an amount equal to the sum of (i) 12 months (or 18 months in the case of Dr. Lammers) of base salary and (ii) 100% (or 150% in the case of Dr. Lammers) of the executive's target bonus. The calculations in the table are based on each executive's annual base salary as of May 31, 2017 ($415,000 for Dr. Lammers and $334,800 for Mr. Fuhrman) and each executive's target bonus as of May 31, 2017 ($207,500 for Dr. Lammers and, $117,180 for Mr. Fuhrman). The severance payment would be paid in a single cash lump sum, subject to the executive's timely delivery of an effective release of claims to Mirna. The cash severance payments are "double trigger" benefits.

(2) Represents the value of the accelerated vesting of Mirna Options held by Dr. Lammers (covering 248,071 shares of Mirna Common Stock) and Mr. Fuhrman (covering 140,023 shares of Mirna Common Stock). Estimated amounts included in this column represent the excess, if any, of $1.42 per share (which was the average closing trading price of Mirna Common Stock over the first five business days following the public announcement of the transaction) over the option exercise price with respect to all unvested options held by the executive officer as of the date hereof, and are a "single trigger" benefit. The exercise price per share of the unvested options held by each executive exceeds $1.42 such that each such option will be terminated immediately prior to the consummation of the Merger without the executive receiving consideration in connection with the cancellation.

(3) With respect to Dr. Lammers and Mr. Fuhrman, represents 12 months (or 18 months in the case of Dr. Lammers) of healthcare continuation coverage premium reimbursement provided pursuant to the executive's Change in Control Severance Agreement. Such amounts were determined using the premiums in effect as of May 31, 2017. Estimated amounts included in this columns are "double trigger" benefits and subject to the executive's timely delivery of an effective release of claims to Mirna.

(4) In May 2017, Dr. O'Neill resigned as Chief Medical Officer of Mirna.

(5) In June 2016, Dr. Barbosa resigned as Chief Scientific Officer of Mirna.

(6) In December 2016, Mr. Irvin resigned as Vice President of Finance of Mirna.

Employee Benefits Plans

2015 Equity Incentive Award Plan

The Mirna 2015 Plan was adopted by the Mirna Board of Directors in August 2015 and became effective in September 2015 after approval by Mirna Stockholders. The principal purpose of the Mirna 2015 Plan is to attract, retain and motivate certain employees, consultants and directors through the granting of stock-based compensation awards and cash-based performance bonus awards. The Mirna 2015 Plan is expected to remain in effect after the consummation of the Merger.

Share Reserve. Under the Mirna 2015 Plan, 1,671,800 shares of Mirna Common Stock were initially reserved for issuance pursuant to a variety of stock-based compensation awards, including stock options, stock appreciation rights ("SARs"), restricted stock awards, restricted stock unit awards, deferred stock awards, dividend equivalent awards, stock payment awards, performance awards and other stock-based awards. The number of shares initially reserved for issuance or transfer pursuant to awards under the Mirna 2015 Plan has been and will continue to be increased by (i) the number of shares represented by awards outstanding under the 2008 Long Term Incentive Plan (the "2008 Stock Plan") (discussed below) that are forfeited or lapse unexercised and which following the effective date were not issued under the 2008 Stock Plan and (ii) an annual increase on the first day of each calendar year beginning in 2016 and ending in 2025, equal to the lesser of (A) five percent (5%) of the shares of stock outstanding (on an as converted basis) on the last day of the immediately preceding calendar year and (B) such smaller number of shares of stock as determined by the Mirna Board of Directors; provided, however, that no more than 14,000,000 shares of stock may be issued upon the exercise of incentive stock options.

The following counting provisions are in effect for the share reserve under the Mirna 2015 Plan:

- to the extent that an award terminates, expires or lapses for any reason or an award is settled in cash without the delivery of shares, any shares subject to the award at such time will be available for future grants under the Mirna 2015 Plan;

- to the extent shares are tendered or withheld to satisfy the grant, exercise price or tax withholding obligation with respect to any award under the Mirna 2015 Plan, such tendered or withheld shares will be available for future grants under the Mirna 2015 Plan;
- to the extent that shares of Mirna Common Stock are repurchased by Mirna prior to vesting so that shares are returned to Mirna, such shares will be available for future grants under the Mirna 2015 Plan;
- the payment of dividend equivalents in cash in conjunction with any outstanding awards will not be counted against the shares available for issuance under the Mirna 2015 Plan; and
- to the extent permitted by applicable law or any exchange rule, shares issued in assumption of, or in substitution for, any outstanding awards of any entity acquired in any form of combination by Mirna or any of Mirna's subsidiaries will not be counted against the shares available for issuance under the Mirna 2015 Plan.

Administration. The compensation committee of the Mirna Board of Directors administers the Mirna 2015 Plan. The compensation committee must consist of at least three members of the Mirna Board of Directors, each of whom is intended to qualify as an "outside director," within the meaning of Section 162(m) of the Code, a "non-employee director" for purposes of Rule 16b-3 under the Exchange Act and an "independent director" within the meaning of the rules of the applicable stock exchange, or other principal securities market on which shares of Mirna Common Stock are traded. The Mirna 2015 Plan provides that the Mirna Board of Directors or compensation committee may delegate its authority to grant awards to employees (other than executive officers and certain senior executives) of Mirna to a committee consisting of one or more members of the Mirna Board of Directors or one or more of Mirna's officers. Awards made to Mirna's non-employee directors must be approved by the full Mirna Board of Directors.

Subject to the terms and conditions of the Mirna 2015 Plan, the administrator has the authority to select the persons to whom awards are to be made, to determine the number of shares to be subject to awards and the terms and conditions of awards, and to make all other determinations and to take all other actions necessary or advisable for the administration of the Mirna 2015 Plan. The administrator is also authorized to adopt, amend or rescind rules relating to administration of the Mirna 2015 Plan. The Mirna Board of Directors may at any time remove the compensation committee as the administrator and revest in itself the authority to administer the Mirna 2015 Plan. The Mirna Board of Directors administers the Mirna 2015 Plan with respect to awards to non-employee directors.

Eligibility. Options, stock appreciation rights, restricted stock and all other stock-based and cash-based awards under the Mirna 2015 Plan may be granted to individuals who are then Mirna's officers, employees or consultants or are the officers, employees or consultants of certain of Mirna's subsidiaries. Such awards also may be granted to Mirna's directors. Only employees of Mirna or certain of Mirna's subsidiaries may be granted incentive stock options.

Awards. The Mirna 2015 Plan provides that the administrator may grant or issue stock options, SARs, restricted stock, restricted stock units, deferred stock, dividend equivalents, performance awards, stock payments and other stock-based and cash-based awards, or any combination thereof. Each award is set forth in a separate agreement with the person receiving the award and indicates the type, terms and conditions of the award.

- *Nonstatutory Stock Options* ("NSOs") provide for the right to purchase shares of Mirna Common Stock at a specified price which may not be less than fair market value on the date of grant, and usually become exercisable (at the discretion of the administrator) in one or more installments after the grant date, subject to the participant's continued employment or service with Mirna and/or subject to the satisfaction of corporate performance targets and individual performance targets established by the administrator. NSOs may be granted for any term specified by the administrator that does not exceed 10 years.

- *Incentive Stock Options* ("ISOs") are designed in a manner intended to comply with the provisions of Section 422 of the Code and are subject to specified restrictions contained in the Code. Among such restrictions, ISOs must have an exercise price of not less than the fair market value of a share of common stock on the date of grant, may only be granted to employees, and must not be exercisable after a period of 10 years measured from the date of grant. In the case of an ISO granted to an individual who owns (or is deemed to own) at least 10% of the total combined voting power of all classes of Mirna's capital stock, the Mirna 2015 Plan provides that the exercise price must be at least 110% of the fair market value of a share of Mirna Common Stock on the date of grant and the ISO must not be exercisable after a period of five years measured from the date of grant.
- *Restricted Stock* may be granted to any eligible individual and made subject to such restrictions as may be determined by the administrator. Restricted stock, typically, may be forfeited for no consideration or repurchased by Mirna at the original purchase price if the conditions or restrictions on vesting are not met. In general, restricted stock may not be sold or otherwise transferred until the restrictions thereto are removed or expire. Purchasers of restricted stock, unlike recipients of options, have voting rights and have the right to receive dividends, if any, prior to the time when the restrictions lapse, however, extraordinary dividends will generally be placed in escrow, and will not be released until the restrictions thereto are removed or expire.
- *Restricted Stock Units* may be awarded to any eligible individual, typically without payment of consideration, but subject to vesting conditions based on continued employment or service or on performance criteria established by the administrator. Like restricted stock, restricted stock units may not be sold, or otherwise transferred or hypothecated, until the vesting conditions thereto are removed or expire. Unlike restricted stock, stock underlying restricted stock units will not be issued until the restricted stock units have vested, and recipients of restricted stock units generally have no voting or dividend rights prior to the time when the vesting conditions thereto are satisfied.
- *Deferred Stock Awards* represent the right to receive shares of Mirna Common Stock on a future date. Deferred stock may not be sold or otherwise hypothecated or transferred until issued. Deferred stock will not be issued until the deferred stock award has vested, and recipients of deferred stock generally have no voting or dividend rights prior to the time when the vesting conditions are satisfied and the shares are issued. Deferred stock awards generally will be forfeited, and the underlying shares of deferred stock will not be issued, if the applicable vesting conditions and other restrictions are not met.
- *Stock Appreciation Rights*, or SARs, may be granted in connection with stock options or other awards, or separately. SARs granted in connection with stock options or other awards typically provide for payments to the holder based upon increases in the price of Mirna Common Stock over a set exercise price. The exercise price of any SAR granted under the Mirna 2015 Plan must be at least 100% of the fair market value of a share of Mirna Common Stock on the date of grant. Except as required by Section 162(m) of the Code with respect to a SAR intended to qualify as performance-based compensation as described in Section 162(m) of the Code, there are no restrictions specified in the Mirna 2015 Plan on the exercise of SARs or the amount of gain realizable therefrom, although restrictions may be imposed by the administrator in the SAR agreements.

SARs under the Mirna 2015 Plan are settled in cash or shares of Mirna Common Stock, or in a combination of both, at the election of the administrator.

- *Dividend Equivalents* represent the value of the dividends, if any, per share paid by Mirna, calculated with reference to the number of shares covered by the award. Dividend equivalents may be settled in cash or shares and at such times as determined by the compensation committee or the Mirna Board of Directors, as applicable.
- *Performance Awards* may be granted by the administrator on an individual or group basis. Generally, these awards will be based upon specific performance targets and may be paid in cash or in common stock or in a combination of both. Performance awards may include "phantom" stock awards that

provide for payments based upon the value of Mirna Common Stock. Performance awards may also include bonuses that may be granted by the administrator on an individual or group basis and which may be payable in cash or in common stock or in a combination of both.

- *Stock Payments* may be authorized by the administrator in the form of common stock or an option or other right to purchase common stock as part of a deferred compensation or other arrangement in lieu of all or any part of compensation, including bonuses, that would otherwise be payable in cash to the employee, consultant or non-employee director.

Change in Control. In the event of a change in control where the acquiror does not assume or replace awards granted, prior to the consummation of such transaction, awards issued under the Mirna 2015 Plan will be subject to accelerated vesting such that 100% of such awards will become vested and exercisable or payable, as applicable. Performance awards will vest in accordance with the terms and conditions of the applicable award agreement. In the event that, within the 12 month period immediately following a change in control, a participant's services with Mirna are terminated by Mirna other than for cause (as defined in the Mirna 2015 Plan) or by such participant for good reason (as defined in the Mirna 2015 Plan), then the vesting and, if applicable, exercisability of 100% of the then-unvested shares subject to the outstanding equity awards held by such participant under the Mirna 2015 Plan will accelerate effective as of the date of such termination. The administrator may also make appropriate adjustments to awards under the Mirna 2015 Plan and is authorized to provide for the acceleration, cash-out, termination, assumption, substitution or conversion of such awards in the event of a change in control or certain other unusual or nonrecurring events or transactions. Under the Mirna 2015 Plan, a change in control is generally defined as:

- the transfer or exchange in a single transaction or series of related transactions by Mirna Stockholders of more than 50% of Mirna's voting stock to a person or group;
- a change in the composition of the Mirna Board of Directors over a two-year period such that 50% or more of the members of the Mirna Board of Directors were elected through one or more contested elections;
- a merger, consolidation, reorganization or business combination in which Mirna is involved, directly or indirectly, other than a merger, consolidation, reorganization or business combination which results in Mirna's outstanding voting securities immediately before the transaction continuing to represent a majority of the voting power of the acquiring company's outstanding voting securities and after which no person or group beneficially owns 50% or more of the outstanding voting securities of the surviving entity immediately after the transaction;
- the sale, exchange, or transfer of all or substantially all of Mirna's assets; or
- stockholder approval of Mirna's liquidation or dissolution.

Adjustments of Awards. In the event of any stock dividend, stock split, spin-off, recapitalization, distribution of Mirna's assets to stockholders (other than normal cash dividends) or any other corporate event affecting the number of outstanding shares of Mirna Common Stock or the share price of Mirna Common Stock other than an "equity restructuring" (as defined below), the administrator may make appropriate, proportionate adjustments to reflect the event giving rise to the need for such adjustments, with respect to:

- the aggregate number and type of shares subject to the Mirna 2015 Plan;
- the number and kind of shares subject to outstanding awards and terms and conditions of outstanding awards (including, without limitation, any applicable performance targets or criteria with respect to such awards); and
- the grant or exercise price per share of any outstanding awards under the Mirna 2015 Plan.

In the event of one of the adjustments described above or other corporate transactions, in order to prevent dilution or enlargement of the potential benefits intended to be made available under the Mirna 2015 Plan, the administrator has the discretion to make such equitable adjustments and may also:

- provide for the termination or replacement of an award in exchange for cash or other property;
- provide that any outstanding award cannot vest, be exercised or become payable after such event;
- provide that awards may be exercisable, payable or fully vested as to shares of common stock covered thereby; or
- provide that an award under the Mirna 2015 Plan cannot vest, be exercised or become payable after such event.

In the event of an equity restructuring, the administrator will make appropriate, proportionate adjustments to the number and type of securities subject to each outstanding award and the exercise price or grant price thereof, if applicable. In addition, the administrator will make equitable adjustments, as the administrator in its discretion may deem appropriate to reflect such equity restructuring, with respect to the aggregate number and type of shares subject to the Mirna 2015 Plan. The adjustments upon an equity restructuring are nondiscretionary and will be final and binding on the affected holders and Mirna.

For purposes of the Mirna 2015 Plan, “equity restructuring” means a nonreciprocal transaction between Mirna and Mirna Stockholders, such as a stock dividend, stock split, spin-off, rights offering or recapitalization through a large, nonrecurring cash dividend, that affects the number or kind of shares (or other securities) or the share price of Mirna Common Stock (or other securities) and causes a change in the per share value of the Mirna Common Stock underlying outstanding stock-based awards granted under the Mirna 2015 Plan.

Amendment and Termination. The Mirna Board of Directors or the compensation committee (with approval of the Mirna Board of Directors) may terminate, amend or modify the Mirna 2015 Plan at any time and from time to time. However, Mirna must generally obtain stockholder approval:

- to increase the number of shares of Mirna Common Stock available under the Mirna 2015 Plan (other than in connection with certain corporate events, as described above);
- to grant options with an exercise price that is below 100% of the fair market value of shares of Mirna Common Stock on the grant date;
- to extend the exercise period for an option beyond 10 years from the date of grant; or
- to the extent required by applicable law, rule or regulation (including any applicable stock exchange rule).

Termination. The Mirna Board of Directors may terminate the Mirna 2015 Plan at any time. No incentive stock options may be granted pursuant to the Mirna 2015 Plan after the tenth anniversary of the effective date of the Mirna 2015 Plan, and no additional annual share increases to the Mirna 2015 Plan’s aggregate share limit will occur from and after such anniversary. Any award that is outstanding on the termination date of the Mirna 2015 Plan will remain in force according to the terms of the Mirna 2015 Plan and the applicable award agreement.

2008 Long Term Incentive Plan

The Mirna Board of Directors adopted, and Mirna Stockholders approved, the 2008 Stock Plan, effective as of May 15, 2008, which was subsequently amended on November 3, 2009, October 22, 2012 and March 10, 2014 to increase the number of shares issuable under the 2008 Stock Plan. The 2008 Stock Plan provided for the grant of ISOs, NSOs, SARs, restricted stock, restricted stock units, bonus stock awards, dividend equivalents, performance awards and other stock-based awards. The 2008 Stock Plan was terminated in September 2015, and no further awards may be granted under the 2008 Stock Plan. However, all outstanding awards continue to be governed by their existing terms.

2015 Employee Stock Purchase Plan

In August 2015, the Mirna Board of Directors approved the 2015 Employee Stock Purchase Plan (the "ESPP"), which became effective in September 2015. The ESPP allows eligible employees to purchase shares of Mirna Common Stock at a discount through payroll deductions of up to 15% of their eligible compensation, subject to any plan limitations. The ESPP generally provides for set offering periods, and at the end of each offering period, employees are able to purchase shares at 85% of the lower of the fair market value of the Mirna Common Stock on the first trading day of the offering period or on the last trading day of the offering period. Mirna has suspended future issuances of Mirna Common Stock under the ESPP, but the combined organization may resume issuances under the ESPP at any time following the consummation of the Merger.

Interests of the Synlogic Directors and Executive Officers in the Merger

In considering the recommendation of the Synlogic Board of Directors with respect to adopting the Merger Agreement, Synlogic Stockholders should be aware that certain members of the Synlogic Board of Directors and certain executive officers of Synlogic may have interests in the Merger that may be different from, or in addition to, the interests of Synlogic Stockholders. Each of the Mirna Board of Directors and the Synlogic Board of Directors was aware of these potential conflicts of interest and considered them, among other matters, in reaching their respective decisions to approve the Merger Agreement and the Merger, and to recommend, as applicable, that Mirna Stockholders approve the proposals to be presented to Mirna Stockholders for consideration at the Annual Meeting as contemplated by this proxy statement/prospectus/information statement, and that Synlogic Stockholders sign and return the written consent as contemplated by this proxy statement/prospectus/information statement.

Ownership Interests

Certain of Synlogic's directors and executive officers currently hold shares of Synlogic Capital Stock. The table below sets forth the anticipated ownership of Synlogic Capital Stock by Synlogic's directors and executive officers immediately prior to the Closing based on their ownership of Synlogic's Capital Stock as of May 31, 2017.

Directors and Executive Officers	Number of Shares of Synlogic Capital Stock Held Immediately Prior to the Closing
Peter Barrett, Ph.D.(1)	4,793,861
Chau Khuong(2)	2,377,073
Nick Leschly(3)	41,849
Edward Mathers	—
Jose Carlos Gutierrez-Ramos, Ph.D.(4)	655,494
Todd Shegog(5)	94,438
Aoife M. Brennan, MB, BCh, BAO, MMSc(6)	93,578
Paul Miller, Ph.D.(7)	135,819
Richard Schwartz, Ph.D.(8)	54,966
Caroline B. Kurtz, Ph.D.(9)	80,576

(1) See Note 1 to the following table.
(2) See Note 2 to the following table.
(3) Consists of 41,849 shares of Synlogic Common Stock held by Mr. Leschly subject to a restricted stock agreement.
(4) Consists of 655,494 shares of Synlogic Common Stock held by Dr. Gutierrez-Ramos subject to a restricted stock agreement.

(5) Consists of 94,438 shares of Synlogic Common Stock held by Mr. Shegog subject to a restricted stock agreement.
(6) Consists of 93,578 shares of Synlogic Common Stock held by Dr. Brennan subject to a restricted stock agreement.
(7) Consists of 135,819 shares of Synlogic Common Stock held by Dr. Miller subject to a restricted stock agreement.
(8) Consists of 54,966 shares of Synlogic Common Stock held by Dr. Schwartz subject to a restricted stock agreement.
(9) Consists of 80,576 shares of Synlogic Common Stock held by Dr. Kurtz subject to a restricted stock agreement.

Certain Synlogic Stockholders affiliated with Synlogic's directors also currently hold shares of Synlogic Capital Stock. The table below sets forth the anticipated ownership of Synlogic Capital Stock by affiliates of Synlogic's directors immediately prior to the Closing based on their ownership of Synlogic Capital Stock as of May 31, 2017.

Stockholder Name	Number of Shares of Synlogic Capital Stock Held Immediately Prior to the Closing
Atlas Venture Fund IX, L.P.(1)	4,793,861
OrbiMed Private Investments VI, L.P.(2)	2,377,073
New Enterprise Associates 14, L.P.(3)	6,136,008

(1) Consists of (i) 500,000 shares of Synlogic Common Stock, (ii) 559,770 shares of Series A-1 preferred stock, (iii) 790,476 shares of Series A-2 preferred stock, (iv) 1,474,998 shares of Series A-3 preferred stock, (v) 1,096,408 shares of Series B preferred stock, and (vi) 372,209 shares of Series C preferred stock. All shares are held directly by Atlas Venture Fund IX, L.P., or Atlas Venture Fund IX. Atlas Venture Associates IX, L.P., or AVA IX LP, is the general partner of Atlas Venture Fund IX, and Atlas Venture Associates IX, LLC, or AVA IX LLC, is the general partner of AVA IX LP. Peter Barrett, Bruce Booth, Jean-Francois Formela, Jeff Fagnan, Chris Lynch and Ryan Moore are the members of AVA IX LLC and collectively make investment decisions on behalf of Atlas Venture Fund IX, and each is a director of AVA IX LLC. Dr. Barrett is also chairman of the Synlogic Board of Directors. Dr. Barrett disclaims beneficial ownership of such shares, except to the extent of his proportionate pecuniary interest therein, if any.
(2) Consists of (i) 2,004,864 shares of Series B preferred stock and (ii) 372,209 shares of Series C preferred stock. All shares are held directly by OrbiMed Private Investments VI, L.P., or OPI VI. OrbiMed Capital GP VI LLC, or GP VI, is the general partner of OPI VI. OrbiMed Advisors LLC, or OrbiMed, is the managing member of GP VI. Samuel D. Isaly is the managing member of and owner of a controlling interest in OrbiMed. By virtue of such relationships, GP VI, OrbiMed and Mr. Isaly may be deemed to have voting and investment power with respect to the shares held by OPI VI and as a result may be deemed to have beneficial ownership of such shares. Chau Khuong is employed as a Private Equity Partner at OrbiMed and is a member of the Synlogic Board of Directors. Each of GP VI, OrbiMed, Mr. Isaly and Mr. Khuong disclaims beneficial ownership of the shares held by OPI VI, except to the extent of its or his pecuniary interest therein, if any.
(3) Consists of (i) 727,272 shares of Series A-1 preferred stock, (ii) 1,185,714 shares of Series A-2 preferred stock, (iii) 2,149,999 shares of Series A-3 preferred stock, (iv) 1,576,745 shares of Series B preferred stock, and (v) 496,278 shares of Series C preferred stock. All shares are directly held by New Enterprise Associates 14, L.P., or NEA 14. NEA Partners 14, L.P., or NEA Partners 14, is the sole general partner of NEA 14. NEA 14 GP, LTD, or NEA 14 LTD, is the sole general partner of NEA Partners 14. The individual Managers, or the Managers, of NEA 14 LTD are M. James Barrett, Peter J. Barris, Forest Baskett, Ryan D. Drant, Anthony A. Florence, Jr., Patrick J. Kerins, Krishna Kolluri, David M. Mott, Scott D. Sandell, Peter Sonsini, Ravi Viswanathan and Harry R. Weller. The Managers share voting and dispositive power with regard to shares held directly by NEA 14. Ed Mathers is a partner at NEA and is also a member of the Synlogic Board of Directors.

Treatment of Synlogic Options

Under the Merger Agreement, at the Effective Time, each Synlogic Option outstanding and unexercised as of immediately prior to the Effective Time, whether or not vested, shall be converted into and become an option to purchase that number of shares of Mirna Common Stock equal to the product obtained by multiplying (i) the number of shares of Synlogic Common Stock that were subject to such Synlogic Option immediately prior to the Effective Time by (ii) the Exchange Ratio, and rounding the resulting number down to the nearest whole number of shares of Mirna Common Stock. The per share exercise price for shares of Mirna Common Stock issuable upon exercise of each Synlogic Option assumed by Mirna shall be determined by dividing (a) the per share exercise price of Synlogic Common Stock subject to such Synlogic Option, as in effect immediately prior to the Effective Time, by (b) the Exchange Ratio, and rounding the resulting exercise price up to the nearest whole cent. Any restriction on the exercise of any Synlogic Option assumed by Mirna will continue in full force and effect and the term, exercisability, vesting schedule and other provisions of such Synlogic Option shall otherwise remain unchanged. Certain of Synlogic's directors and executive officers currently hold Synlogic Options. The table below sets forth certain information with respect to such Synlogic Options.

Optionholder Name	Grant Date	Expiration Date	Exercise Price ($)	Number of Shares of Synlogic Common Stock Underlying Option as of May 31, 2017	Number Shares of Synlogic Common Stock Underlying Option Vested as of May 31, 2017
Nick Leschly	5/15/2017	5/15/2027	7.48	34,287	9,999
Jose Carlos Gutierrez-Ramos, Ph.D.	5/15/2017	5/15/2027	7.48	300,000	—
Todd Shegog	5/15/2017	5/15/2027	7.48	77,374	—
	5/15/2017	5/15/2027	7.48	55,000	—
Aoife M. Brennan, MB, BCh, BAO, MMSc	5/15/2017	5/15/2027	7.48	76,669	—
	5/15/2017	5/15/2027	7.48	75,000	—
Paul Miller, Ph.D.	5/15/2017	5/15/2027	7.48	5,023	3,335
	5/15/2017	5/25/2027	7.48	49,554	10,320
Richard Schwartz, Ph.D.	5/15/2017	5/15/2027	7.48	45,034	—
	5/15/2017	5/15/2027	7.48	21,000	—
Caroline B. Kurtz, Ph.D.	5/15/2017	5/15/2027	7.48	66,017	—
	5/15/2017	5/15/2027	7.48	22,000	—

Management Following the Merger

As described elsewhere in this proxy statement/prospectus/information statement, including in the section captioned "Management Following the Merger," certain of Synlogic's directors and executive officers are expected to become the directors and executive officers of Mirna upon the Closing.

Indemnification and Insurance

Under the Merger Agreement, from the Effective Time through the sixth anniversary of the date on which the Effective Time occurs, Mirna and Synlogic, as the surviving corporation in the Merger, shall indemnify and hold harmless each person who is or has served as a director or officer of Synlogic against all claims, losses, liabilities, damages, judgments, fines and reasonable fees, costs and expenses, including attorneys' fees and disbursements, incurred in connection with any claim, action, suit, proceeding or investigation, whether civil, criminal, administrative or investigative, arising out of or pertaining to the fact that such person is or was a director or officer of Synlogic, to the fullest extent permitted under the DGCL for directors or officers of Delaware corporations. In addition, each such director and officer, or former director and officer, is entitled to advancement of expenses incurred in the defense of any such claim, action, suit, proceeding or investigation.

Under the Merger Agreement, the provisions of Mirna's amended and restated certificate of incorporation and amended and restated bylaws with respect to indemnification, advancement of expenses and exculpation of present and former directors and officers of Mirna shall not be amended, modified or repealed for a period of six years from the Effective Time in a manner that would adversely affect the rights thereunder of individuals who, at or prior to the Effective Time, were officers or directors of Mirna. The certificate of incorporation and bylaws of Synlogic, as the surviving corporation in the Merger, shall contain provisions no less favorable with respect to indemnification, advancement of expenses and exculpation of former and present directors and officers that are presently set forth in the amended and restated certificate of incorporation and amended and restated bylaws of Mirna.

The Merger Agreement also provides that Mirna shall maintain directors' and officers' liability insurance policies commencing at the Closing, on commercially available terms and conditions with coverage limits customary for U.S. public companies similar situated to Mirna.

Limitations of Liability and Indemnification

In addition to the indemnification required in the amended and restated certificate of incorporation and amended and restated bylaws of Mirna, Mirna entered into indemnification agreements with each of its directors and officers. These agreements provide for the indemnification of the directors and officers of Mirna for all reasonable expenses and liabilities incurred in connection with any action or proceeding brought against them by reason of the fact that they are or were agents of Mirna. Mirna believes that these bylaw provisions and indemnification agreements are necessary to attract and retain qualified persons as directors and officers.

Form of the Merger

The Merger Agreement provides that at the Effective Time, Merger Sub will be merged with and into Synlogic and Synlogic will continue as the surviving corporation and will be a wholly owned subsidiary of Mirna.

After completion of the Merger, assuming Proposal No. 3 is approved by Mirna Stockholders at the Annual Meeting, Mirna will be renamed "Synlogic, Inc." and expects to trade on the NASDAQ Global Market under the symbol "SYBX."

Merger Consideration and Adjustment

At the Effective Time:

- each share of Synlogic Capital Stock outstanding immediately prior to the Effective Time will automatically be converted solely into the right to receive a number of shares of Mirna Common Stock equal to the Exchange Ratio, subject to adjustment to account for the Reverse Stock Split and for Mirna's net cash immediately prior to the Closing and in accordance with the Merger Agreement; and
- each Synlogic Option outstanding and unexercised immediately prior to the Effective Time, whether vested or unvested, will be assumed by Mirna and will become an option, subject to vesting, to purchase shares of Mirna Common Stock.

The Exchange Ratio is calculated using a formula intended to allocate to existing Synlogic Stockholders (on a fully-diluted basis), a percentage of the combined organization. Based on Synlogic's and Mirna's capitalization as of May 31, 2017, the Exchange Ratio is currently estimated to be approximately 4.0807 pre-split shares of Mirna Common Stock for each share of Synlogic Capital Stock, subject to (i) adjustment to account for the effect of the Reverse Stock Split, (ii) adjustments to account for the issuance of any additional shares of Synlogic Capital Stock or Mirna Common Stock, as applicable, prior to the consummation of the Merger, and (iii) an upward or downward adjustment to the extent that Mirna's net cash immediately prior to the Closing is greater or less than $40 million (and as a result, Mirna Stockholders could own less, and Synlogic Stockholders could own more, of the combined organization).

Immediately after the consummation of the Merger, based on the Exchange Ratio, it is expected that existing Synlogic Stockholders and Synlogic Optionholders are expected to own, or hold rights to acquire, approximately 83% of the fully-diluted Mirna Common Stock and existing Mirna Stockholders (including holders of shares of Mirna Common Stock received upon the automatic exercise, pursuant to the Merger Agreement, of any Mirna Options having an exercise price per share less than the Mirna Closing Price) are expected to own approximately 17% of the fully-diluted Mirna Common Stock. The initial Exchange Ratio assumes a $222 million valuation of Synlogic prior to the Merger and assumes that Mirna will have $40 million in net cash immediately prior to Closing. Accordingly, such percentages are subject to adjustment based on the final Exchange Ratio as set forth in the Merger Agreement.

The Exchange Ratio formula is the quotient obtained by dividing the number of Synlogic merger shares (defined below) by the Synlogic fully-diluted outstanding shares (defined below), where:

- Synlogic merger shares is the product determined by multiplying (i) the post-closing Mirna shares by (ii) the Synlogic allocation percentage;
- Synlogic fully-diluted outstanding shares is the total number of shares of Synlogic Capital Stock outstanding immediately prior to the Effective Time on a fully-diluted and an as-converted to Synlogic Common Stock basis, assuming the exercise of each outstanding Synlogic Option outstanding immediately prior to the Effective Time and the issuance of shares of Synlogic Common Stock in respect of all other options, warrants or rights to receive such shares that will be outstanding immediately after the Effective Time;
- post-closing Mirna shares is the quotient determined by dividing (i) the Mirna fully-diluted outstanding shares by (ii) the Mirna allocation percentage;
- Mirna fully-diluted outstanding shares is the total number of shares of Mirna Common Stock outstanding immediately prior to the Effective Time on a fully-diluted and an as-converted to Mirna Common Stock basis, assuming (i) the settlement in shares of each Mirna Option outstanding as of the Effective Time, solely to the extent such Mirna Option will not be canceled at the Effective Time or exercised prior thereto and (ii) the issuance of shares of Mirna Common Stock in respect of all other options, warrants or rights to receive such shares that will be outstanding as of immediately after the Effective Time;
- Synlogic allocation percentage means 1.00 minus the Mirna allocation percentage; and
- Mirna allocation percentage means 0.1685; provided, however, to the extent that Mirna's net cash determined pursuant to the Merger Agreement (i) is less than $40 million, then 0.1685 shall be reduced by 0.0003 for each $100,000 that Mirna's net cash as so determined is less than $40 million and (ii) is more than $40 million, then 0.1685 shall be increased by 0.0003 for each $100,000 that Mirna's net cash as so determined is more than $40 million.

Examples

For illustrative purposes only, two example scenarios calculating the Exchange Ratio are described below. These example scenarios have assumed that: (i) the Effective Time occurs on August 15, 2017, (ii) Mirna fully-diluted outstanding shares is equal to 20,856,693, and (iii) Synlogic fully-diluted outstanding shares is equal to 25,221,865. For the purposes of this illustration, it is assumed that no Mirna Options will be net exercised for shares of Mirna Common Stock pursuant to the terms of the Merger Agreement. Further, the below illustrations do not give effect to any adjustment for the Reverse Stock Split.

Case 1: Mirna's net cash is $38.0 million.

In this case, the Mirna allocation percentage will be 0.1625.

The Synlogic allocation percentage will be 1.00 – 0.1625 = 0.8375.

The post-closing Mirna shares is equal to the quotient determined by dividing (i) the Mirna fully-diluted outstanding shares by (ii) the Mirna allocation percentage;

20,856,693 / 0.1625 = 128,348,880

The Synlogic merger shares is equal to the product determined by multiplying (i) the post-closing Mirna shares by (ii) the Synlogic allocation percentage.

128,348,880 x 0.8375 = 107,492,187

The Exchange Ratio will thus be the quotient obtained by dividing the number of Synlogic merger shares by the number of Synlogic fully-diluted outstanding shares.

107,492,187 / 25,221,865 = 4.2619

Case 2: Mirna's net cash is $42 million.

In this case, the Mirna allocation percentage will be 0.1745.

The Synlogic allocation percentage will be 1.00 – 0.1745 = 0.8255.

The post-closing Mirna shares is equal to the quotient determined by dividing (i) the Mirna fully-diluted outstanding shares by (ii) the Mirna allocation percentage;

20,856,693 / 0.1745 = 119,522,595

The Synlogic merger shares is equal to the product determined by multiplying (i) the post-closing Mirna shares by (ii) the Synlogic allocation percentage.

119,522,595 x 0.8255 = 98,665,902

The Exchange Ratio will thus be the quotient obtained by dividing the number of Synlogic merger shares by the number of Synlogic fully-diluted outstanding shares.

98,665,902 / 25,221,865 = 3.9119

The Merger Agreement does not include a price-based termination right, and there will be no adjustment to the total number of shares of Mirna Common Stock that Synlogic Stockholders will be entitled to receive for changes in the market price of Mirna Common Stock. Accordingly, the market value of the shares of Mirna Common Stock issued pursuant to the Merger will depend on the market value of the shares of Mirna Common Stock at Closing, and could vary significantly from the market value of Mirna Common Stock on the date of this proxy statement/prospectus/information statement.

No fractional shares of Mirna Common Stock will be issuable to Synlogic Stockholders pursuant to the Merger Agreement. Instead, each Synlogic Stockholder who would otherwise be entitled to receive a fraction of a share of Mirna Common Stock, after aggregating all fractional shares of Mirna Common Stock issuable to such stockholder, will be entitled to receive in cash the dollar amount, rounded to the nearest whole cent, without interest, determined by multiplying such fraction by the closing price of a share of Mirna Common Stock on NASDAQ on the date the Merger becomes effective.

Determination of Mirna's Net Cash

The Merger Agreement includes a condition to Synlogic's obligation to close the Merger that requires Mirna to have a minimum of $33.5 million in net cash immediately prior to the Closing (as calculated pursuant to the terms of the Merger Agreement). The Closing could be delayed if Synlogic and Mirna are not able to agree upon the amount of Mirna's net cash as of Mirna's cash determination date.

Under the Merger Agreement, Mirna's "net cash" is defined as (i) the sum of Mirna's cash and cash equivalents, marketable securities, accounts, interest and other receivables (to the extent determined to be collectible), and deposits (to the extent refundable to Mirna), in each case as of the cash determination date set forth in the Merger Agreement, determined in a manner consistent with the manner in which such items were historically determined and in accordance with Mirna's audited financial statements and Mirna's unaudited interim balance sheet, ***minus*** (ii) the sum of (a) Mirna's accounts payable and accrued expenses (without duplication of any expenses accounted for below and other than accrued expenses that are Mirna transaction expenses under the Merger Agreement) and Mirna's other current liabilities payable in cash, in each case as of such cash determination date and determined in a manner consistent with the manner in which such items were historically determined and in accordance with Mirna's audited financial statements and Mirna's unaudited interim balance sheet and (b) any unpaid Mirna transaction expenses, ***minus*** (iii) any unpaid amounts payable by Mirna in satisfaction of its obligations to purchase a six year "tail" policy on its directors' and officers' liability insurance as set forth in the Merger Agreement ***minus*** (iv) all outstanding liabilities and obligations of Mirna pursuant to the termination of certain lease agreements and as set forth in the Merger Agreement.

Mirna's net cash balance at the cash determination date is subject to numerous factors, many of which are outside of Mirna's control. If Mirna's net cash immediately prior to the Closing is less than $33.5 million, based on the manner of calculating net cash pursuant to the Merger Agreement, Mirna would be unable to satisfy a closing condition for the Merger, in which case Synlogic could elect to waive the condition or choose to not consummate the Merger. Furthermore, the Exchange Ratio at the Closing will be subject to adjustment to the extent that Mirna's net cash immediately prior to the Closing is less than or greater than $40 million (and as a result, Mirna Stockholders and Synlogic Stockholders could own more or less of the combined organization), as described under "*The Merger Agreement—Merger Consideration and Exchange Ratio*."

Procedures for Exchanging Synlogic Stock Certificates

The Merger Agreement provides that, at the Effective Time, Mirna will deposit with an exchange agent acceptable to Mirna and Synlogic evidence of book-entry shares representing the shares of Mirna Common Stock issuable to Synlogic Stockholders and a sufficient amount of cash to make payments in lieu of fractional shares.

The Merger Agreement provides that, promptly after the Effective Time, the exchange agent will mail to each record holder of shares of Synlogic Capital Stock immediately prior to the Effective Time a letter of transmittal and instructions for surrendering and exchanging Synlogic stock certificates held by such record holder in exchange for book-entry shares of Mirna Common Stock. Upon surrender of a Synlogic stock certificate for exchange to the exchange agent, together with a duly signed letter of transmittal and such other documents as the exchange agent or Mirna may reasonably require, the Synlogic stock certificate surrendered will be cancelled and the holder of such Synlogic stock certificate will be entitled to receive the following:

- book-entry shares representing the number of whole shares of Mirna Common Stock that such holder has the right to receive pursuant to the provisions of the Merger Agreement; and
- cash in lieu of any fractional share of Mirna Common Stock.

From and after the Effective Time, until it is surrendered, each certificate that previously evidenced shares of Synlogic Capital Stock will be deemed to represent only the right to receive book-entry shares of Mirna Common Stock, and cash in lieu of any fractional share of Mirna Common Stock. Mirna will not pay dividends

or other distributions on any shares of Mirna Common Stock to be issued in exchange for any unsurrendered Synlogic stock certificate until such Synlogic stock certificate is surrendered as provided in the Merger Agreement.

If any Synlogic stock certificate has been lost, stolen or destroyed, Mirna may, in its discretion, and as a condition precedent to the delivery of any book-entry shares of Mirna Common Stock, require the owner of such lost, stolen or destroyed certificate to provide an affidavit claiming such certificate has been lost, stolen or destroyed and post a bond indemnifying Mirna against any claim suffered by Mirna related to the lost, stolen or destroyed certificate or any Mirna Common Stock issued in exchange for such certificate as Mirna may reasonably request.

Effective Time of the Merger

The Merger Agreement requires the parties to consummate the Merger as promptly as practicable (and in any event within two business days) after all of the conditions to the consummation of the Merger contained in the Merger Agreement are satisfied or waived, including the adoption of the Merger Agreement by the Synlogic Stockholders and the approval by the Mirna Stockholders of the issuance of Mirna Common Stock, the amendment to the amended and restated certificate of incorporation of Mirna effecting the Reverse Stock Split and the other transactions contemplated by the Merger Agreement. The Merger will become effective upon the filing of a certificate of merger with the Secretary of State of the State of Delaware or at such later time as is agreed by Mirna and Synlogic and specified in the certificate of merger. Neither Mirna nor Synlogic can predict the exact timing of the consummation of the Merger.

Regulatory Approvals

In the United States, Mirna must comply with applicable federal and state securities laws and the rules and regulations of NASDAQ in connection with the issuance of shares of Mirna Common Stock and the filing of this proxy statement/prospectus/information statement with the SEC.

Tax Treatment of the Merger

Mirna and Synlogic intend for the Merger to qualify as a reorganization within the meaning of Section 368(a) of the Code. Each of Mirna and Synlogic will use its commercially reasonable efforts to cause the Merger to qualify as a reorganization within the meaning of Section 368(a) of the Code, and not to permit or cause any affiliate or any subsidiary of Mirna or Synlogic to, take any action or cause any action to be taken which would reasonably be expected to prevent the Merger from qualifying as a reorganization within the meaning Section 368(a) of the Code.

Material U.S. Federal Income Tax Consequences of the Merger

The following discussion summarizes the material U.S. federal income tax consequences of the Merger that are expected to apply generally to each Synlogic Stockholder upon the exchange of shares of Synlogic Capital Stock for shares of Mirna Common Stock upon the consummation of the Merger. This summary is based upon current provisions of the Code, existing Treasury regulations and current administrative rulings and court decisions, all in effect as of the date hereof and all of which are subject to change. Any change, which may be retroactive, could alter the tax consequences to Mirna, Synlogic or the Synlogic Stockholders as described in this summary.

No attempt has been made to comment on all of the U.S. federal income tax consequences of the Merger that may be relevant to particular holders, including holders who do not hold their shares as capital assets; holders subject to special treatment under the Code such as dealers in securities; banks; insurance companies; other financial institutions; mutual funds; real estate investment trusts; regulated investment companies;

tax-exempt organizations; pass-through entities such as partnerships, S corporations, disregarded entities for federal income tax purposes and limited liability companies (and investors therein); persons who are not U.S. holders (as defined below); stockholders who are subject to the alternative minimum tax provisions of the Code; Synlogic Stockholders who hold their shares as part of a hedge, wash sale, synthetic security, conversion transaction, or other integrated transaction; persons that have a functional currency other than the U.S. dollar; traders in securities who elect to apply a mark-to-market method of accounting; persons who hold shares of Synlogic Capital Stock that may constitute "qualified small business stock" under Section 1202 of the Code or as "Section 1244 stock" for purposes of Section 1244 of the Code; Synlogic Stockholders who acquired their shares of stock in a transaction subject to the gain rollover provisions of Section 1045 of the Code; Synlogic Stockholders who acquired their shares of stock pursuant to the exercise of options or otherwise as compensation or through a tax-qualified retirement plan or through the exercise of a warrant or conversion rights under convertible instruments; and certain expatriates or former citizens or long-term residents of the United States. Stockholders described in this paragraph are urged to consult their own tax advisors regarding the consequences to them of the Merger.

In the case of a stockholder that is a partnership, the U.S. federal income tax treatment of a partner in the partnership will generally depend upon the status of the partner, the activities of the partnership and certain determinations made at the partner level. Partnerships that are holders of Synlogic Capital Stock and partners in such partnerships are urged to consult their own tax advisors regarding the tax consequences to them of the Merger.

In addition, the following discussion does not address the tax consequences of the Merger under state, local or non-U.S. tax laws or federal tax laws other than income tax laws. Furthermore, the following discussion does not address: (a) the tax consequences of transactions effectuated before, after or at the same time as the Merger, whether or not they are in connection with the Merger, including, without limitation, transactions in which shares of Synlogic Capital Stock are acquired or disposed of other than in exchange for shares of Mirna Common Stock in the Merger; (b) the tax consequences to holders of options or warrants issued by Synlogic which are assumed in connection with the Merger; (c) the tax consequences of the receipt of shares of Mirna Common Stock other than in exchange for shares of Synlogic Capital Stock pursuant to the Merger Agreement; (d) any U.S. federal non-income tax consequences of the Merger, including estate, gift or other tax consequences; (e) any state, local or non-U.S. tax consequences of the Merger; or (f) the Medicare contribution tax on net investment income. No ruling from the Internal Revenue Service (the "IRS") or opinion of counsel, has been or will be requested in connection with the Merger, and Synlogic Stockholders should be aware that the IRS could adopt a position which could be sustained by a court contrary to that set forth in this discussion.

Holders of Synlogic Capital Stock are urged to consult their tax advisors regarding the U.S. federal income tax consequences of the Merger in light of their personal circumstances and the consequences under state, local and non-U.S. tax laws and other federal tax laws.

Treatment of the Merger as a "Reorganization" under Section 368(a)

Mirna and Synlogic intend the Merger to qualify as a reorganization within the meaning of Section 368(a) of the Code, but the Merger may not so qualify. The Merger is not conditioned on the receipt of a tax opinion, or any other condition, relating to the qualification of the Merger as such a reorganization.

Definition of "U.S. Holder"

For purposes of this discussion, a "U.S. holder" is a beneficial owner of Synlogic Capital Stock that is:

- an individual who is a citizen or resident of the United States;
- a corporation or any other entity taxable as a corporation created or organized in or under the laws of the United States or of a state of the United States, any state thereof or the District of Columbia;

- a trust if either (i) a court within the United States is able to exercise primary supervision over the administration of such trust, and one or more United States persons (within the meaning of Section 7701(a)(30) of the Code) are authorized or have the authority to control all substantial decisions of such trust, or (ii) the trust was in existence on August 20, 1996 and has a valid election in effect under applicable Treasury Regulations to be treated as a United States person for U.S. federal income tax purposes; or
- an estate, the income of which is subject to U.S. federal income tax regardless of its source.

Treatment of U.S. Holders in the Merger

If the Merger qualifies as a reorganization within the meaning of Section 368(a) of the Code, Synlogic Stockholders generally will not recognize gain or loss upon the exchange of their Synlogic Capital Stock for Mirna Common Stock, except to the extent of cash received in lieu of a fractional share of Mirna Common Stock as described below. Synlogic Stockholders generally will obtain a basis in the Mirna Common Stock they receive in the Merger equal to their basis in the exchanged Synlogic Capital Stock. The holding period of the shares of Mirna Common Stock received by a Synlogic Stockholder in the Merger will include the holding period of the shares of Synlogic Capital Stock surrendered in exchange therefor. A U.S. holder who receives cash in lieu of a fractional share of Mirna Common Stock will be treated for U.S. federal income tax purposes as having received such fractional share pursuant to the Merger and then as having exchanged such fractional share for cash in a redemption by Mirna. Such U.S. holder will recognize gain or loss equal to the difference, if any, between such stockholder's basis in the fractional share and the amount of cash received. Such gain or loss will be a long-term capital gain or loss, if the U.S. holder's holding period is greater than one year as of the date of the Closing. The deductibility of capital losses is subject to limitations.

If the Merger is not treated as a reorganization within the meaning of Section 368(a) of the Code, then each U.S. holder generally will be treated as exchanging its Synlogic Capital Stock in a fully taxable transaction in exchange for Mirna Common Stock and any cash received in lieu of a fractional share. Synlogic Stockholders will generally recognize gain or loss in such exchange equal to the amount that such Synlogic Stockholder's adjusted tax basis in the Synlogic Capital Stock surrendered is less or more than the fair market value of the Mirna Common Stock and any cash in lieu of a fractional share received in exchange therefor. Gain or loss recognized upon such an exchange generally will be capital gain or capital loss. Any recognized capital gain or capital loss will be long-term capital gain or capital loss, if the U.S. holder has held the shares of Synlogic Capital Stock for more than one year. The deductibility of capital losses is subject to limitations. In addition, for purposes of the above discussion of the bases and holding periods for shares of Synlogic Capital Stock and Mirna Common Stock, U.S. holders who acquired different blocks of Synlogic Capital Stock at different times for different prices must calculate their gains and losses and holding periods separately for each identifiable block of such stock exchanged in the Merger.

Reporting Requirements

If the Merger is a reorganization within the meaning of Section 368(a) of the Code, each U.S. holder who receives shares of Mirna Common Stock in the Merger is required to retain permanent records pertaining to the Merger, and make such records available to any authorized IRS officers and employees. Such records should specifically include information regarding the amount, basis, and fair market value of all transferred property, and relevant facts regarding any liabilities assumed or extinguished as part of such reorganization. Additionally, U.S. holders who owned immediately before the Merger at least one percent (by vote or value) of the total outstanding stock of Synlogic are required to attach a statement to their tax returns for the year in which the Merger is consummated that contains the information listed in Treasury Regulation Section 1.368-3(b). Such statement must include the U.S. holder's tax basis in such holder's Synlogic Capital Stock surrendered in the Merger, the fair market value of such stock, the date of the Merger and the name and employer identification number of each of Synlogic and Mirna. U.S. holders are urged to consult with their tax advisors to comply with these rules.

Information Reporting and Backup Withholding

A U.S. holder of Synlogic Capital Stock may be subject to information reporting and backup withholding for U.S. federal income tax purposes on cash paid in lieu of fractional shares in connection with the Merger. Backup withholding will not apply, however, to a holder who (i) furnishes a correct taxpayer identification number and certifies the holder is not subject to backup withholding on IRS Form W-9 or a substantially similar form, (ii) provides a certification of foreign status on an appropriate IRS Form W-8 or successor form or (iii) certifies the holder is otherwise exempt from backup withholding. If a U.S. holder does not provide a correct taxpayer identification number on IRS Form W-9 or other proper certification, the stockholder may be subject to penalties imposed by the IRS. Any amounts withheld under the backup withholding rules may be refunded or allowed as a credit against the federal income tax liability of a U.S. holder of Synlogic Capital Stock, if any, provided the required information is timely furnished to the IRS. U.S. holders of Synlogic Capital Stock should consult their tax advisors regarding their qualification for an exemption from backup withholding, the procedures for obtaining such an exemption, and in the event backup withholding is applied, to determine if any tax credit, tax refund or other tax benefit may be obtained.

The foregoing summary is of a general nature only and is not intended to be, and should not be construed to be, legal, business or tax advice to any particular Synlogic Stockholder. This summary does not take into account your particular circumstances and does not address consequences that may be particular to you. Therefore, you should consult your tax advisor regarding the particular consequences of the Merger to you.

NASDAQ Global Market Listing

Mirna Common Stock is currently listed on the NASDAQ Global Market under the symbol "MIRN." Mirna has agreed to use commercially reasonable efforts to maintain its existing listing on the NASDAQ Global Market, and to obtain approval for listing on the NASDAQ Global Market of the shares of Mirna Common Stock that Synlogic Stockholders will be entitled to receive pursuant to the Merger. In addition, under the Merger Agreement, each party's obligation to complete the Merger is subject to the satisfaction or waiver by each of the parties, at or prior to the Closing, of various conditions, including that the existing shares of Mirna Common Stock must have been continually listed on the NASDAQ Global Market, and Mirna must have caused the shares of Mirna Common Stock to be issued in the Merger to be approved for listing on the NASDAQ Global Market as of the Closing.

Prior to consummation of the Merger, Mirna intends to file an initial listing application with the NASDAQ Global Market pursuant to NASDAQ "reverse merger" rules. If such application is accepted, Mirna anticipates that Mirna Common Stock will be listed on the NASDAQ Global Market following the Closing under the trading symbol "SYBX".

Anticipated Accounting Treatment

The Merger is expected to be treated by Mirna as a reverse merger and will be accounted for as an asset acquisition in accordance with U.S. GAAP. For accounting purposes, Synlogic is considered to be acquiring the assets and liabilities of Mirna in this transaction. Management of Mirna and Synlogic have made a preliminary estimated purchase price calculated as described in Note 2 to the Unaudited Pro Forma Condensed Combined Financial Information. A final determination of these estimated fair values, which cannot be made prior to the completion of the transaction, will be based on the actual assets and liabilities of Mirna that exist as of the date of completion of the transaction.

Appraisal Rights and Dissenters' Rights

Delaware Law

If the Merger is completed, Synlogic Stockholders who do not deliver a written consent approving the Merger are entitled to appraisal rights under Section 262 of the DGCL ("Section 262"), *provided* that they

comply with the conditions established by Section 262. Holders of Mirna Common Stock are not entitled to appraisal rights under Delaware law in connection with the Merger.

The discussion below is not a complete summary regarding a Synlogic Stockholders's appraisal rights under Delaware law and is qualified in its entirety by reference to the text of the relevant provisions of Delaware law, which are attached to this proxy statement/prospectus/information statement as *Annex C*. Synlogic Stockholders intending to exercise appraisal rights should carefully review *Annex C*. Failure to follow precisely any of the statutory procedures set forth in *Annex C* may result in a termination or waiver of these rights. This summary does not constitute legal or other advice, nor does it constitute a recommendation that Synlogic Stockholders exercise their appraisal rights under Delaware law.

Under Section 262, where a merger is adopted by stockholders by written consent in lieu of a meeting of stockholders pursuant to Section 228 of the DGCL, either the constituent corporation, before the effective date of the merger, or the surviving corporation, within 10 days after the effective date of the merger, must notify each stockholder of the constituent corporation entitled to appraisal rights of the approval of the merger, the effective date of the merger and that appraisal rights are available.

If the Merger is completed, within 10 days after the effective date of the Merger Synlogic will notify its stockholders that the Merger has been approved, the effective date of the Merger and that appraisal rights are available to any stockholder who has not approved the Merger. Holders of shares of Synlogic Capital Stock who desire to exercise their appraisal rights must deliver a written demand for appraisal to Synlogic within 20 days after the date of mailing of that notice, and that stockholder must not have delivered a written consent approving the Merger. A demand for appraisal must reasonably inform Synlogic of the identity of the stockholder and that such stockholder intends thereby to demand appraisal of the shares of Synlogic Capital Stock held by such stockholder. Failure to deliver a written consent approving the Merger will not in and of itself constitute a written demand for appraisal satisfying the requirements of Section 262. All demands for appraisal should be addressed to Synlogic, Inc., 200 Sidney St., Suite 320, Cambridge, MA 02139, Attention: Christina Tartaglia, and should be executed by, or on behalf of, the record holder of shares of Synlogic Capital Stock. ALL DEMANDS MUST BE RECEIVED BY SYNLOGIC WITHIN TWENTY (20) DAYS AFTER THE DATE SYNLOGIC MAILS A NOTICE TO ITS STOCKHOLDERS NOTIFYING THEM THAT THE MERGER HAS BEEN APPROVED, THE EFFECTIVE DATE OF THE MERGER AND THAT APPRAISAL RIGHTS ARE AVAILABLE TO ANY STOCKHOLDER WHO HAS NOT APPROVED THE MERGER.

If a holder of shares of Synlogic Capital Stock fails to deliver a written demand for appraisal within the time period specified above, such holder will be entitled to receive the merger consideration for such holder's shares of Synlogic Capital Stock as provided for in the Merger Agreement, but will have no appraisal rights with respect to such holder's shares of Synlogic Capital Stock.

To be effective, a demand for appraisal by a holder of shares of Synlogic Capital Stock must be made by, or in the name of, the registered stockholder, fully and correctly, as the stockholder's name appears on the stockholder's stock certificate(s). Beneficial owners who do not also hold the shares of record may not directly make appraisal demands to Synlogic. The beneficial owner must, in these cases, have the registered owner, such as a broker, bank or other custodian, submit the required demand in respect of those shares. If shares are owned of record in a fiduciary capacity, such as by a trustee, guardian or custodian, execution of a demand for appraisal should be made by or for the fiduciary; and if the shares are owned of record by more than one person, as in a joint tenancy or tenancy in common, the demand should be executed by or for all joint owners. An authorized agent, including an authorized agent for two or more joint owners, may execute the demand for appraisal for a stockholder of record; however, the agent must identify the record owner or owners and expressly disclose the fact that, in executing the demand, he or she is acting as agent for the record owner. A record owner, such as a broker, who holds shares as a custodian for others, may exercise the record owner's right of appraisal with respect to the shares held for one or more beneficial owners, while not exercising this right for other beneficial owners. In that case, the written demand should state the number of shares as to which appraisal is sought. Where

no number of shares is expressly mentioned, the demand will be presumed to cover all shares held in the name of the record owner. In addition, the stockholder must continuously hold the shares of record from the date of making the demand through the Effective Time.

If a holder of shares of Synlogic Capital Stock holds shares of Synlogic Capital Stock in a brokerage account or in other custodian form and such holder wishes to exercise appraisal rights, such holder should consult with such holder's bank, broker or other custodian to determine the appropriate procedures for the making of a demand for appraisal by the custodian.

At any time within 60 days after the Effective Time of the Merger, any stockholder who has demanded an appraisal, but has neither commenced an appraisal proceeding or joined an appraisal proceeding as a named party, has the right to withdraw such stockholder's demand and accept the terms of the Merger by delivering a written withdrawal to Synlogic. If, following a demand for appraisal, a holder of shares of Synlogic Capital Stock who has demanded an appraisal has withdrawn such holder's demand for appraisal in accordance with Section 262, such holder will have the right to receive the merger consideration for such holder's shares of Synlogic Capital Stock.

Within 120 days after the effective date of the Merger, any stockholder who has delivered a demand for appraisal in accordance with Section 262 will, upon written request to the surviving corporation, be entitled to receive a written statement setting forth the aggregate number of shares not voted in favor of the Merger Agreement and with respect to which demands for appraisal rights have been received and the aggregate number of holders of such shares. This written statement will be mailed to the requesting stockholder within 10 days after the stockholder's written request is received by the surviving corporation or within 10 days after expiration of the period for delivery of demands for appraisal, whichever is later. Within 120 days after the effective date of the Merger, either the surviving corporation or any stockholder who has delivered a demand for appraisal in accordance with Section 262 may file a petition in the Delaware Court of Chancery demanding a determination of the fair value of the shares held by all such stockholders. Upon the filing of the petition by a stockholder, service of a copy of the petition must be made upon the surviving corporation. The surviving corporation has no obligation to file a petition in the Delaware Court of Chancery in the event there are dissenting stockholders, and Synlogic, which is expected to be the surviving corporation, has no present intent to file a petition in the Delaware Court of Chancery. Accordingly, the failure of a stockholder to file a petition within the period specified could nullify the stockholder's previously written demand for appraisal.

If a petition for appraisal is duly filed by a stockholder and a copy of the petition is delivered to the surviving corporation, the surviving corporation will then be obligated, within 20 days after receiving service of a copy of the petition, to provide the Delaware Court of Chancery with a duly verified list containing the names and addresses of all stockholders who have demanded an appraisal of their shares and with whom agreements as to the value of their shares have not been reached by the surviving corporation. After notice to dissenting stockholders who demanded appraisal of their shares, the Delaware Court of Chancery is empowered to conduct a hearing upon the petition, and to determine those stockholders who have complied with Section 262 and who have become entitled to the appraisal rights provided thereby. The Delaware Court of Chancery may require the stockholders who have demanded appraisal for their shares to submit their stock certificates to the Register in Chancery for notation thereon of the pendency of the appraisal proceedings; and if any stockholder fails to comply with that direction, the Delaware Court of Chancery may dismiss the proceedings as to that stockholder. If immediately before the merger the shares of a class or series of stock as to which appraisal rights are available were listed on a national securities exchange, the Delaware Court of Chancery will dismiss the proceedings as to all holders of such shares who are otherwise entitled to appraisal rights unless (1) the total number of shares entitled to appraisal exceeds 1% of the outstanding shares of the class or series eligible for appraisal, (2) the value of the consideration provided in the merger for such total number of shares exceeds $1.0 million or (3) the merger was approved pursuant to Sections 253 or 267 of the DGCL.

After determination of the stockholders entitled to appraisal of their shares, the Delaware Court of Chancery will appraise the "fair value" of the shares owned by those stockholders. This value will be exclusive of any

element of value arising from the accomplishment or expectation of the Merger, but may include a fair rate of interest, if any, upon the amount determined to be the fair value. At any time before the entry of judgment in the proceedings, the surviving corporation may pay to each shareowner entitled to appraisal an amount in cash, in which case interest shall accrue thereafter only upon the sum of (1) the difference, if any, between the amount paid and the fair value of the shares determined by the Delaware Court of Chancery, and (2) interest theretofore accrued, unless paid at that time. When the value is determined, the Delaware Court of Chancery will direct the payment of the value, with interest thereon accrued during the pendency of the proceeding, if the Delaware Court of Chancery so determines, to the stockholders entitled to receive the same, upon surrender by the holders of the certificates representing those shares.

In determining fair value, and, if applicable, a fair rate of interest, the Delaware Court of Chancery is required to take into account all relevant factors. In *Weinberger v. UOP, Inc.*, the Delaware Supreme Court discussed the factors that could be considered in determining fair value in an appraisal proceeding, stating that "proof of value by any techniques or methods which are generally considered acceptable in the financial community and otherwise admissible in court" should be considered, and that "fair price obviously requires consideration of all relevant factors involving the value of a company."

Section 262 provides that fair value is to be "exclusive of any element of value arising from the accomplishment or expectation of the Merger." In *Cede & Co. v. Technicolor, Inc.*, the Delaware Supreme Court stated that this exclusion is a "narrow exclusion [that] does not encompass known elements of value," but which rather applies only to the speculative elements of value arising from such accomplishment or expectation. In *Weinberger*, the Delaware Supreme Court construed Section 262 to mean that "elements of future value, including the nature of the enterprise, which are known or susceptible of proof as of the date of the Merger and not the product of speculation, may be considered."

Holders of shares of Synlogic Capital Stock should be aware that the fair value of such holder's shares as determined under Section 262 could be more than, the same as, or less than the value that such holder is entitled to receive under the terms of the Merger Agreement.

Costs of the appraisal proceeding may be imposed upon the surviving corporation and the stockholders participating in the appraisal proceeding by the Delaware Court of Chancery as the Court deems equitable in the circumstances. Upon the application of a stockholder, the Delaware Court of Chancery may order all or a portion of the expenses incurred by any stockholder in connection with the appraisal proceeding, including, without limitation, reasonable attorneys' fees and the fees and expenses of experts, to be charged pro rata against the value of all shares entitled to appraisal. In the absence of such a determination of assessment, each party bears its own expenses. Any stockholder who had demanded appraisal rights will not, after the Effective Time, be entitled to vote shares subject to that demand for any purpose or to receive payments of dividends or any other distribution with respect to those shares, other than with respect to payment as of a Record Date prior to the Effective Time; however, if no petition for appraisal is filed within 120 days after the Effective Time, or if the stockholder delivers a written withdrawal of his or her demand for appraisal and an acceptance of the terms of the Merger within 60 days after the Effective Time, then the right of that stockholder to appraisal will cease and that stockholder will be entitled to receive the merger consideration for shares of his or her Mirna capital stock pursuant to the Merger Agreement. Any withdrawal of a demand for appraisal made more than 60 days after the Effective Time may only be made with the written approval of the surviving corporation. No appraisal proceeding in the Delaware Court of Chancery will be dismissed as to any stockholder without the approval of the court.

Failure to follow the steps required by Section 262 for perfecting appraisal rights may result in the loss of appraisal rights. In view of the complexity of Section 262, stockholders who may wish to dissent from the Merger and pursue appraisal rights should consult their legal advisors.

THE MERGER AGREEMENT

The following is a summary of the material terms of the Merger Agreement. A copy of the Merger Agreement is attached to this proxy statement/prospectus/information statement as Annex A and is incorporated by reference into this proxy statement/prospectus/information statement. The Merger Agreement has been attached to this proxy statement/prospectus/information statement to provide you with information regarding its terms. It is not intended to provide any other factual information about Mirna, Synlogic or Merger Sub. The following description does not purport to be complete and is qualified in its entirety by reference to the Merger Agreement. You should refer to the full text of the Merger Agreement for details of the Merger and the terms and conditions of the Merger Agreement.

The Merger Agreement contains representations and warranties that Mirna and Merger Sub, on the one hand, and Synlogic, on the other hand, have made to one another as of specific dates. These representations and warranties have been made for the benefit of the other parties to the Merger Agreement and may be intended not as statements of fact but rather as a way of allocating the risk to one of the parties if those statements prove to be incorrect. In addition, the assertions embodied in the representations and warranties are qualified by information in confidential disclosure schedules exchanged by the parties in connection with signing the Merger Agreement. While Mirna and Synlogic do not believe that these disclosure schedules contain information required to be publicly disclosed under the applicable securities laws, other than information that has already been so disclosed, the disclosure schedules do contain information that modifies, qualifies and creates exceptions to the representations and warranties set forth in the attached Merger Agreement. Accordingly, you should not rely on the representations and warranties as current characterizations of factual information about Mirna or Synlogic, because they were made as of specific dates, may be intended merely as a risk allocation mechanism between Mirna, Merger Sub and Synlogic and are modified by the disclosure schedules.

General

Under the Merger Agreement, at the Effective Time Merger Sub will merge with and into Synlogic, with Synlogic surviving as a wholly owned subsidiary of Mirna.

Treatment of Mirna Options

Prior to the Closing, the Mirna Board of Directors will adopt appropriate resolutions and take all other actions necessary and appropriate to provide that each outstanding and unexercised Mirna Option, whether vested or unvested, will be accelerated in full effective as of immediately prior to the Effective Time. Effective as of the Effective Time, each outstanding and unexercised Mirna Option having an exercise price per share less than the Mirna Closing Price will be automatically exercised in full and, in exchange therefor, each holder of any such automatically exercised Mirna Options will be entitled to receive a number of shares of Mirna Common Stock calculated by dividing (a) the product of (i) the total number of shares of Mirna Common Stock previously subject to such Mirna Option, and (ii) the excess of the Mirna Closing Price over the exercise price per share of the Mirna Common Stock previously subject to such Mirna Option by (b) the Mirna Closing Price. Each outstanding and unexercised Mirna Option that has an exercise price equal to or greater than the Mirna Closing Price will be terminated and cease to exist as of immediately prior to the Effective Time for no consideration and the shares of Mirna Common Stock underlying the unexercised Mirna Options will be returned to the Mirna 2015 Plan.

Treatment of Synlogic Options

Pursuant to the Merger Agreement, at the Effective Time, each Synlogic Option that is outstanding and unexercised immediately prior to the Effective Time granted under the Synlogic 2017 Stock Incentive Plan, whether or not vested, will be assumed by Mirna and will become an option to purchase that number of shares of Mirna Common Stock equal to the product obtained by multiplying (i) the number of shares of Synlogic

Common Stock that were subject to such Synlogic Option immediately prior to the Effective Time by (ii) the Exchange Ratio, and rounding the resulting number down to the nearest whole number of shares of Mirna Common Stock. The per share exercise price for Mirna Common Stock issuable upon exercise of each Synlogic Option assumed by Mirna shall be determined by dividing (a) the per share exercise price of Synlogic Common Stock subject to such Synlogic Option, as in effect immediately prior to the Effective Time, by (b) the Exchange Ratio, and rounding the resulting exercise price up to the nearest whole cent. Any restriction on the exercise of any Synlogic Option assumed by Mirna will continue in full force and effect and the term, exercisability, vesting schedule and other provisions of such Synlogic Option shall otherwise remain unchanged.

Directors and Officers of Mirna Following the Merger

Pursuant to the Merger Agreement, each of the directors and officers of Mirna who will not continue as directors or officers of Mirna following the consummation of the Merger, will resign immediately prior to the Effective Time. Following the consummation of the Merger, the Mirna Board of Directors will include a total seven directors. Pursuant to the terms of the Merger Agreement, four of such directors will be designated by Synlogic, two of such directors will be designated by Mirna, and one director will be an independent designee designated by Synlogic. Effective as of the Effective Time, it is anticipated that Edward Mathers and Michael Powell, Ph.D. will remain as directors of Mirna. Mr. Mathers and Dr. Powell will elect Peter Barrett, Chau Q. Khuong, Nick Leschly and Jose Carlos Gutierrez-Ramos, Ph.D., to the Mirna Board of Directors. Immediately following the consummation of the Merger, it is anticipated that the Mirna Board of Directors will have one vacancy which will be filled by a person to be designated by Synlogic. It is anticipated that the executive officers of Mirna upon the Closing will be Jose Carlos Gutierrez-Ramos, Ph.D., President and Chief Executive Officer, Todd Shegog, Chief Financial Officer, Aoife M. Brennan, Chief Medical Officer, Paul Miller, Chief Scientific Officer, Richard M. Schwartz, Senior Vice President, Process Development and Manufacturing and Caroline B. Kurtz, Head of Translational Sciences and Product Development.

Amended and Restated Certificate of Incorporation and Amendments to the Amended and Restated Certificate of Incorporation of Mirna

Mirna Stockholders of record on the Record Date will also be asked to approve amendments to the amended and restated certificate of incorporation of Mirna to effect the Reverse Stock Split and the Mirna Name Change, in each case, upon consummation of the Merger, each of which requires the affirmative vote of holders of a majority of the outstanding shares of Mirna Common Stock on the Record Date.

Conditions to the Completion of the Merger

Each party's obligation to complete the Merger is subject to the satisfaction or waiver by each of the parties, at or prior to the Closing, of various conditions, which include the following:

- the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, must have been declared effective by the SEC in accordance with the Securities Act and must not be subject to any stop order or proceeding, or any proceeding threatened by the SEC, seeking a stop order that has not been withdrawn;
- there must not have been issued, and remain in effect, any temporary restraining order, preliminary or permanent injunction or other order preventing the consummation of the Merger or any of the other transactions contemplated by the Merger Agreement by any court of competent jurisdiction or other governmental entity of competent jurisdiction, and no law, statute, rule, regulation, ruling or decree shall be in effect which has the effect of making the consummation of the Merger or any of the other transactions contemplated by the Merger Agreement illegal;
- the holders of a majority of the outstanding shares of Synlogic Common Stock and Synlogic Preferred Stock, voting together as one class, and the holders of a majority of the outstanding shares of Synlogic

Preferred Stock, voting as a separate class, must have adopted and approved the Merger, and the holders of a majority of the outstanding shares of Mirna Common Stock must have approved the Merger Agreement and the transactions contemplated thereby, including the Merger and the issuance of Mirna Common Stock in the Merger;

- the existing shares of Mirna Common Stock must have been continually listed on the NASDAQ Global Market through the Closing, and Mirna must have caused the shares of Mirna Common Stock to be issued in the Merger to be approved for listing on the NASDAQ Global Market (subject to official notice of issuance) as of the Closing;
- any waiting period under the Hart-Scott-Rodino Antitrust Improvements Act of 1976 ("HSR") must have expired or been terminated; and
- there must not be any legal proceeding pending, or overtly threatened in writing, by an official governmental body (i) challenging or seeking to restrain or prohibit the consummation of the Merger, (ii) relating to Mirna and seeking to obtain from Mirna, Synlogic or Merger Sub any damages or other relief that may be material to Mirna or Synlogic, (iii) seeking to prohibit or limit in any material and adverse respect a party's ability to vote, transfer, receive dividends with respect to, or otherwise exercise ownership rights with respect to Mirna Common Stock, (iv) that would materially and adversely affect the right of Mirna or Synlogic to own the assets or operate the business of Mirna or Synlogic, or (v) seeking to compel Mirna, Synlogic or any of Synlogic's subsidiaries to dispose of or hold separate any material assets as a result of the Merger.

In addition, each party's obligation to complete the Merger is further subject to the satisfaction or waiver by that party of the following additional conditions:

- the representations and warranties regarding certain matters related to organization, authority, vote required and financial advisors of the other party in the Merger Agreement must be true and correct on the date of the Merger Agreement and on the closing date of the Merger with the same force and effect as if made on the date on which the Merger is to be completed or, if such representations and warranties address matters as of a particular date, then as of that particular date;
- the representations and warranties regarding capitalization matters of the other party in the Merger Agreement must be true and correct on the date of the Merger Agreement and on the closing date of the Merger with the same force and effect as if made on the date on which the Merger is to be completed or, if such representations and warranties address matters as of a particular date, then as of that particular date, except for such inaccuracies which are de minimis, individually or in the aggregate;
- the remaining representations and warranties of the other party in the Merger Agreement must be true and correct on the date of the Merger Agreement and on the closing date of the Merger with the same force and effect as if made on the date on which the Merger is to be completed or, if such representations and warranties address matters as of a particular date, then as of that particular date, except in each case, or in the aggregate, where the failure to be so true and correct would not reasonably be expected to have a Company Material Adverse Effect or Meerkat Material Adverse Effect (each as defined below), as applicable (without giving effect to any references therein to any Company Material Adverse Effect or Meerkat Material Adverse Effect, as applicable, or other materiality qualifications);
- the other party to the Merger Agreement must have performed or complied with in all material respects all of such party's agreements and covenants required to be performed or complied with by it under the Merger Agreement at or prior to the Effective Time;
- the other party must have delivered certain certificates and other documents required under the Merger Agreement for the Closing; and

- the party must have received from the other party lock-up agreements executed by certain stockholders of such party and each person who shall be elected or appointed as an executive officer or director of such party immediately following the Closing.

In addition, the obligation of Mirna and Merger Sub to complete the Merger is further subject to the satisfaction or waiver of the following conditions:

- there shall have been no effect, change, event, circumstance, or development that (considered together with all other effects, changes, events, circumstances, or developments that have occurred prior to the applicable date of determination) has or would reasonably be expected to have a material adverse effect on the business, financial condition, assets, liabilities or results of operations of Synlogic or its subsidiaries, taken as a whole (a "Company Material Adverse Effect"); *provided* that effects, changes, events, circumstances or developments arising from the following shall not be taken into account for purposes of determining whether a Company Material Adverse Effect shall have occurred:
  - any rejection or non-acceptance by a governmental body of a registration or filing by Synlogic relating to intellectual property owned, licensed or controlled by Synlogic;
  - the announcement or pendency of the Merger Agreement or the transactions contemplated thereby;
  - the taking of any action, or the failure to take any action, by Synlogic that is required to comply with the terms of the Merger Agreement;
  - any natural disaster or any act or threat of terrorism or war anywhere in the world, any armed hostilities or terrorist activities anywhere in the world, any threat or escalation of armed hostilities or terrorist activities anywhere in the world or any governmental or other response or reaction to any of the foregoing;
  - any change in generally accepted accounting principles or any change in applicable laws, rules or regulations or the interpretation thereof;
  - general economic or political conditions or conditions generally affecting the industries in which the Synlogic and its subsidiaries operate; or
  - any change in the cash position of Synlogic or its subsidiaries which results from operations in the ordinary course of business.

In addition, the obligation of Synlogic to complete the Merger is further subject to the satisfaction or waiver of the following conditions:

- the officers and directors of Mirna who are not to continue as officers of Mirna following the consummation of the Merger, will sign written resignations in forms satisfactory to Synlogic, dated as of the closing date and effective as of the Closing;
- the principal executive officer or the principal financial officer of Mirna shall have provided, with respect to any document filed with the SEC on or after the date of the Merger Agreement, any necessary certification required under Rule 13a-14 under the Exchange Act;
- there shall have been no effect, change, event, circumstance, or development that (considered together with all other effects, changes, circumstances, or developments that have occurred prior to the applicable date of determination) has or would reasonably be expected to have a material adverse effect on the business, financial condition, assets, liabilities or results of operations of Mirna and its subsidiaries, taken as a whole (a "Meerkat Material Adverse Effect"); *provided*, that effects, changes, events, circumstances or developments resulting from the following shall not be taken into account for purposes of determining whether a Meerkat Material Adverse Effect shall have occurred:
  - any rejection or non-acceptance by a governmental body of a registration or filing by Mirna relating to intellectual property owned, licensed or controlled by Mirna;

- the announcement or pendency of the Merger Agreement or the transactions contemplated thereby;
- any change in the stock price or trading volume of Mirna Common Stock;
- the taking of any action, or the failure to take any action, by Mirna that is required to comply with the terms of the Merger Agreement;
- any natural disaster or any act or threat of terrorism or war anywhere in the world, any armed hostilities or terrorist activities anywhere in the world, any threat or escalation of armed hostilities or terrorist activities anywhere in the world or any governmental or other response or reaction to any of the foregoing;
- any change in generally accepted accounting principles or any change in applicable laws, rules or regulations or the interpretation thereof; or
- general economic or political conditions or conditions generally affecting the industries in which Mirna operates;

- Mirna must have a net cash balance as determined pursuant to the Merger Agreement greater than or equal to $33.5 million;
- the Mirna Board of Directors shall have been constituted as set forth in the Merger Agreement;
- there shall have been evidence provided to Synlogic, in form and substance reasonably satisfactory to Synlogic, that Mirna has terminated, assigned or fully performed certain contracts and that all obligations of Mirna thereunder have been fully satisfied, waived or otherwise discharged; and
- certain agreements related to CPRIT shall be in effect and shall not have been amended, without Synlogic's prior written consent, prior to the closing date.

Representations and Warranties

The Merger Agreement contains customary representations and warranties of Mirna and Synlogic for a transaction of this type relating to, among other things:

- corporate organization and power, and similar corporate matters;
- subsidiaries;
- authority to enter into the Merger Agreement and the related agreements;
- votes required for completion of the Merger and approval of the proposals that will come before the Annual Meeting and that will be the subject of the written consent of the Synlogic Stockholders;
- except as otherwise specifically disclosed pursuant to in the Merger Agreement, the fact that the consummation of the Merger would not contravene certain contracts or the organizational documents of the parties or require the consent of any third party;
- capitalization;
- financial statements and, with respect to Mirna, documents filed with the SEC and the accuracy of information contained in those documents;
- material changes or events;
- liabilities;
- title to assets;
- real property and leaseholds;
- intellectual property;

- the validity of material contracts to which the parties or their subsidiaries are a party and any violation, default or breach to such contracts;
- regulatory compliance, permits and restrictions;
- legal proceedings and orders;
- tax matters;
- employee and labor matters and benefit plans;
- environmental matters;
- insurance;
- any brokerage or finder's fee or other fee or commission in connection with the Merger;
- transactions with affiliates;
- with respect to Mirna, the valid issuance in the Merger of Mirna Common Stock;
- the inapplicability of Section 203 of the DGCL; and
- with respect to Mirna, matters related to CPRIT.

The representations and warranties are, in many respects, qualified by materiality and knowledge, and will not survive the Merger, but their accuracy forms the basis of one of the conditions to the obligations of Mirna and Synlogic to complete the Merger.

No Solicitation

Each of Mirna and Synlogic have agreed that, except as described below, Mirna and Synlogic and any of their respective subsidiaries will not, nor will either party or any of its subsidiaries authorize any of the directors, officers, employees, agents, attorneys, accountants, investment bankers, advisors or representatives retained by it or any of its subsidiaries to, directly or indirectly:

- solicit, initiate or knowingly encourage, induce or facilitate the communication, making, submission or announcement of, any Acquisition Proposal or Acquisition Inquiry;
- furnish any non-public information with respect to it to any person in connection with or in response to an Acquisition Proposal or Acquisition Inquiry;
- engage in discussions or negotiations with any person with respect to any Acquisition Proposal or Acquisition Inquiry;
- approve, endorse or recommend an Acquisition Proposal; or
- execute or enter into any letter of intent or similar document or any contract contemplating or otherwise relating to an Acquisition Transaction.

An "Acquisition Inquiry" means an inquiry, indication of interest or request for information (other than an inquiry, indication of interest or request for information made or submitted by Synlogic, on the one hand, or Mirna, on the other hand, to the other party) that would reasonably be expected to lead to an Acquisition Proposal.

An "Acquisition Proposal" means any offer or proposal, whether written or oral (other than an offer or proposal made or submitted by or on behalf of Synlogic or any of its affiliates, on the one hand, or by or on behalf of Mirna or any of its affiliates, on the other hand, to the other party) contemplating or otherwise relating to any Acquisition Transaction.

An "Acquisition Transaction" means any transaction or series of related transactions involving:

- any merger, consolidation, amalgamation, share exchange, business combination, issuance or acquisition of securities, reorganization, recapitalization, tender offer, exchange offer or similar transaction: (i) in which Mirna, Synlogic or Merger Sub is a constituent entity, (ii) in which any individual, entity, governmental entity, or "group," as defined under applicable securities laws, directly or indirectly acquires beneficial or record ownership of securities representing more than 20% of the outstanding securities of any class of voting securities of Mirna, Synlogic or Merger Sub or any of their respective subsidiaries or (iii) in which Mirna, Synlogic or Merger Sub or any of their respective subsidiaries issues securities representing more than 20% of the outstanding securities of any class of voting securities of such party or any of its subsidiaries; or
- any sale, lease, exchange, transfer, license, acquisition or disposition of any business or businesses or assets that constitute or account for 20% or more of the consolidated book value or the fair market value of the assets of Mirna, Synlogic or Merger Sub and their respective subsidiaries, as applicable, taken as a whole.

Notwithstanding the foregoing, before obtaining the applicable approvals of the Mirna Stockholders or Synlogic Stockholders required to consummate the Merger, each party may furnish non-public information regarding such party and its subsidiaries to, and may enter into discussions or negotiations with, any third party in response to a bona fide written Acquisition Proposal, which such party's board of directors determines in good faith, after consultation with such party's outside financial advisors and outside legal counsel, constitutes or is reasonably likely to result in a Superior Offer (as defined below), if:

- neither such party nor any representative of such party has breached the non-solicitation provisions of the Merger Agreement described above;
- such party's board of directors concludes in good faith, based on the advice of outside legal counsel, that the failure to take such action is reasonably likely to be inconsistent with the fiduciary duties of such board of directors under applicable legal requirements;
- such party gives the other party at least two business days' prior written notice of the identity of the third party and of that party's intention to furnish information to, or enter into discussions or negotiations with, such third party before furnishing any information or entering into discussions or negotiations with such third party;
- such party receives from the third party an executed confidentiality agreement containing provisions at least as favorable to such party as those contained in the confidentiality agreement between Mirna and Synlogic; and
- at least two business days prior to the furnishing of any non-public information to a third party, such party furnishes the same non-public information to the other party to the extent not previously furnished.

A "Superior Offer" means an unsolicited, bona fide written Acquisition Proposal (with all references to 20% in the definition of Acquisition Transaction being treated as references to greater than 90% for these purposes) that (a) was not obtained or made as a direct or indirect result of a breach, or violation, of the Merger Agreement, and (b) is on terms and conditions that the board of directors of the party receiving the offer determines in good faith, based on such matters that it deems relevant, as well as any written offer by the other party to the Merger Agreement to amend the terms of the Merger Agreement, and following consultation with legal counsel and outside financial advisors, if any, are more favorable, from a financial point of view, to that party's stockholders than the terms of the Merger Agreement.

An Acquisition Proposal will not be considered a Superior Offer if the Acquisition Proposal is subject to a financing condition (and if any financing is required to consummate the transaction contemplated by such Acquisition Proposal, such financing must be fully committed).

The Merger Agreement also provides that each party will promptly advise the other of the status and terms of, and keep the other party reasonably informed with respect to, any Acquisition Proposal or any inquiry, indication of interest or request for information that would reasonably be expected to lead to an Acquisition Proposal or any material change or proposed material change to that Acquisition Proposal or inquiry, indication of interest or request for information that would reasonably be expected to lead to an Acquisition Proposal.

Meetings of Stockholders

Mirna is obligated under the Merger Agreement to call, give notice of and hold a meeting of its stockholders for the purposes of considering the approval of the Merger Agreement and the transactions contemplated thereby, including the Merger and the issuance of shares of Mirna Common Stock to Synlogic Stockholders in the Merger.

Synlogic is obligated under the Merger Agreement to obtain written consents of Synlogic Stockholders sufficient to adopt the Merger Agreement thereby approving the Merger and related transactions within two business days following the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, being declared effective by the SEC.

Covenants; Conduct of Business Pending the Merger

Mirna has agreed that, except as permitted by the Merger Agreement, as required by law, or unless Synlogic shall have provided written consent, during the period commencing on the date of the Merger Agreement and continuing until the earlier to occur of the Effective Time and the termination of the Merger Agreement, Mirna will conduct its business and operations in the ordinary course consistent with past practices and in compliance with all applicable laws, regulations and certain contracts, continue to pay outstanding accounts payable and other current liabilities when due and payable and will take other agreed-upon actions. Mirna has also agreed that, subject to certain limited exceptions, without the consent of Synlogic, it will not, during the period commencing on the date of the Merger Agreement and continuing until the earlier to occur of the Effective Time and the termination of the Merger Agreement:

- declare, accrue, set aside or pay any dividend or make any other distribution in respect of any shares of capital stock; or repurchase, redeem or otherwise reacquire any shares of capital stock or other securities (except for shares of Mirna Common Stock from terminated employees, directors or consultants of Mirna);
- sell, issue, grant, pledge or otherwise dispose of or encumber or authorize any of the foregoing with respect to: any capital stock or other security (except for Mirna Common Stock issued upon the valid exercise of outstanding Mirna Options); any option, warrant or right to acquire any capital stock or any other security; or any instrument convertible into or exchangeable for any capital stock or other security;
- except as required to give effect to anything in contemplation of the Closing, amend the certificate of incorporation, bylaws or other charter or organizational documents of Mirna, or effect or become a party to any merger, consolidation, share exchange, business combination, recapitalization, reclassification of shares, stock split, reverse stock split or similar transaction except as related to the proposed transactions under the Merger Agreement;
- form any subsidiary or acquire any equity interest or other interest in any other entity or enter into any joint venture with any other entity;
- lend money to any person; incur or guarantee any indebtedness for borrowed money; guarantee any debt securities of others; make any capital expenditure or commitment; or forgive any loans to any persons, including Mirna's employees, officers, directors or affiliates;
- adopt, establish or enter into any Mirna employee benefit agreement, plan or arrangement; cause or permit any Mirna employee benefit agreement, plan or arrangement to be amended other than as

required by law or in order to make amendments for purposes of Section 409A of the Internal Revenue Code; pay any bonus or make any profit-sharing or similar payment to, or increase the amount of the wages, salary, commissions, fringe benefits or other compensation or remuneration payable to, any of its employees, directors or consultants; or increase the severance or change of control benefits offered to any current or new employees, directors or consultants;

- enter into any material transaction other than in the ordinary course of business consistent with past practices;
- acquire any material asset or sell, lease or otherwise irrevocably dispose of any of its assets or properties, or grant any encumbrance with respect to such assets or properties, except in the ordinary course of business consistent with past practices;
- sell, assign, transfer, license, sublicense or otherwise dispose of any intellectual property rights owned by Mirna, other than pursuant to non-exclusive licenses in the ordinary course of business consistent with past practices;
- make, change or revoke any material tax election; file any material amendment to any tax return or adopt or change any material accounting method in respect of taxes;
- take any action, other than as required by law or generally accepted accounting principles, to change accounting policies or procedures;
- pay, discharge or satisfy any claims, liabilities or obligations, other than the payment, discharge or satisfaction in the ordinary course consistent with past practice of liabilities reflected or reserved against in Mirna's financial statements delivered to Synlogic or incurred in the ordinary course of business and consistent with past practice;
- except as permitted in the Merger Agreement, enter into, amend or terminate any of Mirna's material contracts;
- materially change pricing or royalties or other payments set or charged by Mirna to its customers or licensees or agree to materially change pricing or royalties or other payments set or charged by persons who have licensed intellectual property of Mirna;
- incur any liabilities or otherwise take any actions other than, in each case, in the ordinary course of business consistent with past practice or in connection with the transactions contemplated by the Merger Agreement, after the calculation of net cash is finalized pursuant to the terms of the Merger Agreement;
- initiate or settle any legal proceeding or other claim or dispute involving or against Mirna or any of its subsidiaries; or
- agree, resolve or commit to do any of the foregoing.

Synlogic has agreed that, except as permitted by the Merger Agreement, as required by law, or unless Mirna shall have provided written consent, during the period commencing on the date of the Merger Agreement and continuing until the earlier to occur of the Effective Time and the termination of the Merger Agreement, Synlogic will conduct its business and operations in the ordinary course consistent with past practices and in compliance with all applicable laws, regulations and certain contracts, and will take other agreed-upon actions. Synlogic has also agreed that, subject to certain limited exceptions, without the consent of Mirna, it will not, during the period commencing on the date of the Merger Agreement and continuing until the earlier to occur of the Effective Time and the termination of the Merger Agreement:

- declare, accrue, set aside or pay any dividend or make any other distribution in respect of any shares of capital stock; or repurchase, redeem or otherwise reacquire any shares of capital stock or other securities (except for shares of common stock from terminated employees, directors or consultants of Synlogic);

- except as required to give effect to anything in contemplation of the Closing, amend the certificate of incorporation, bylaws or other charter or organizational documents of Synlogic or its subsidiaries, or effect or become a party to any merger, consolidation, share exchange, business combination, recapitalization, reclassification of shares, stock split, reverse stock split or similar transaction except as related to the proposed transactions under the Merger Agreement;
- except in connection with the hiring of any new employees, sell, issue, grant, pledge or otherwise dispose of or encumber or authorize any of the foregoing actions with respect to: any capital stock or other security (except for shares of Synlogic Common Stock issued upon the valid exercise of Synlogic Options); any option, warrant or right to acquire any capital stock or any other security, other than option grants to employees and service providers in the ordinary course of business in accordance with past practices; or any instrument convertible into or exchangeable for any capital stock or other security of Synlogic;
- form any subsidiary or acquire any equity interest or other interest in any other entity or enter into a joint venture with any other entity;
- lend money to any person; incur or guarantee any indebtedness for borrowed money, other than in the ordinary course of business in accordance with past practices; guarantee any debt securities of others; or make any capital expenditure or commitment in excess of $1.0 million;
- other than in the ordinary course of business: adopt, establish or enter into any employee benefit agreement, plan or arrangement; cause or permit any employee benefit agreement, plan or arrangement to be amended other than as required by law or in order to make amendments for purposes of Section 409A of the Code; pay any bonus or make any profit-sharing or similar payment to, or increase the amount of the wages, salary, commissions, fringe benefits or other compensation or remuneration payable to, any of its directors, officers or employees;
- enter into any material transaction outside the ordinary course of business in accordance with past practices;
- acquire any material asset or sell, lease or otherwise irrevocably dispose of any of its assets or properties, or grant any encumbrance with respect to such assets or properties, except in the ordinary course of business in accordance with past practices;
- sell, assign, transfer, license, sublicense or otherwise dispose of any material Synlogic intellectual property rights (other than pursuant to non-exclusive licenses in the ordinary course of business in accordance with past practices);
- make, change or revoke any material tax election; file any material amendment to any tax return or adopt or change any material accounting method in respect of taxes;
- enter into, amend or terminate any of Synlogic’s material contracts;
- materially change pricing or royalties or other payments set or charged by Synlogic or any of its subsidiaries to its customer or licensees or agree to materially change pricing or royalties or other payments set or charged by persons who have licensed intellectual property to the Synlogic or any of its subsidiaries;
- initiate or settle any legal proceeding or other claim or dispute involving or against Synlogic or any of its subsidiaries; or
- agree, resolve or commit to do any of the foregoing.

Other Agreements

Each of Mirna and Synlogic has agreed to use its commercially reasonable efforts to cause to be taken all actions necessary to consummate the Merger and the other transactions contemplated by the Merger Agreement. In connection therewith, each party has agreed to:

- make all filings and other submissions (if any) and give all notices (if any) required to be made and given by such party in connection with the Merger and the other transactions contemplated by the Merger Agreement;
- use commercially reasonable efforts to obtain each consent (if any) reasonably required to be obtained in connection with the Merger and the other transactions contemplated by the Merger Agreement;
- use commercially reasonable efforts to lift any injunction prohibiting, or any other legal bar to, the Merger or the other transactions contemplated by the Merger Agreement; and
- use commercially reasonable efforts to satisfy the conditions precedent to the consummation of the transactions contemplated by the Merger Agreement.

Pursuant to the Merger Agreement, Mirna and Synlogic have further agreed that:

- Mirna will use its commercially reasonable efforts to (a) maintain the listing of the Mirna Common Stock on the NASDAQ Global Market until the Closing and to obtain approval for listing of the combined organization on the NASDAQ Global Market; (b) to the extent required by the rules and regulations of NASDAQ, (i) prepare and submit to NASDAQ a notification form for the listing of the shares of Mirna Common Stock to be issued in connection with the Merger and (ii) cause such shares to be approved for listing (subject to official notice of issuance); and (c) to the extent required by Nasdaq Marketplace Rule 5110, file an initial listing application for the Mirna Common Stock on the NASDAQ Global Market and to cause such listing application to be conditionally approved prior to the Effective Time;
- for a period of six years after the Closing, Mirna will indemnify each of the directors and officers of Mirna and Synlogic to the fullest extent permitted under the DGCL and will maintain directors' and officers' liability insurance for the directors and officers of Mirna and Synlogic; and
- Mirna shall maintain directors' and officers' liability insurance policies commencing at the Closing, on commercially reasonable terms and conditions and with coverage limits customary for U.S. public companies similarly situated to Mirna.

Termination

The Merger Agreement may be terminated at any time before the completion of the Merger, whether before or after the required stockholder approvals to complete the Merger have been obtained, as set forth below:

- by mutual written consent of Mirna and Synlogic;
- by either Mirna or Synlogic if the Merger shall not have been consummated by November 15, 2017 (the "End Date"); *provided*, *however*, that this right to terminate the Merger Agreement will not be available to any party whose action or failure to act has been a principal cause of the failure of the Merger to occur on or before the End Date and such action or failure to act constitutes a breach of the Merger Agreement; and *provided*, *further*, that the End Date shall be extended by 60 days upon request of either party if the waiting period under the HSR Act (as defined in the Merger Agreement) has not expired, a request for additional information has been made by any government authority, or in the event that the SEC has not declared effective the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, by the date which is 60 days prior to the End Date;

- by either Mirna or Synlogic if a court of competent jurisdiction or governmental entity has issued a final and nonappealable order, decree or ruling or taken any other action that permanently restrains, enjoins or otherwise prohibits the Merger or any of the other transactions contemplated by the Merger Agreement;
- by Mirna if the written consent of Synlogic Stockholders necessary to adopt the Merger Agreement and approve the Merger and related matters has not been obtained within two business days of the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, becoming effective; *provided* that this right to terminate the Merger Agreement will not be available to Mirna once Synlogic obtains such stockholder approval;
- by either Mirna or Synlogic if the Annual Meeting shall have been held and completed and Mirna Stockholders shall have taken a final vote and shall not have approved the Merger Agreement or any of the transactions contemplated thereby, including the Merger and the issuance of Mirna Common Stock to Synlogic Stockholders in the Merger; *provided*, that Mirna may not terminate the Merger Agreement pursuant to this provision if the failure to obtain the approval of Mirna Stockholders was caused by the action or failure to act of Mirna and such action or failure to act constitutes a material breach by Mirna of the Merger Agreement;
- by Synlogic, at any time prior to the approval by Mirna Stockholders of the proposals to be considered at the Annual Meeting, if any of the following circumstances shall occur (each of the following, a "Mirna Triggering Event"):
    - Mirna fails to include in this proxy statement/prospectus/information statement the Mirna Board of Directors's recommendation that Mirna Stockholders vote to approve the Merger and the issuance of Mirna Common Stock to Synlogic Stockholders in connection with the Merger or withdraws or modifies its recommendation in a manner adverse to Synlogic;
    - the Mirna Board of Directors approves, endorses or recommends any Acquisition Proposal;
    - Mirna enters into any letter of intent or similar document or any contract relating to any Acquisition Proposal, other than a confidentiality agreement permitted pursuant to the Merger Agreement;
    - Mirna or any director, officer or agent of Mirna willfully and intentionally breaches the non-solicitation provisions or the provisions regarding the Annual Meeting set forth in the Merger Agreement; or
    - Mirna fails to hold the Annual Meeting within 60 days after the of the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, being declared effective by the SEC;
- by Mirna, at any time prior to the adoption of the Merger Agreement by the Synlogic Stockholders, if any of the following circumstances shall occur (each a "Synlogic Triggering Event"):
    - the Synlogic Board of Directors withdraws or modifies its recommendation in a manner adverse to Mirna or approves, endorses or recommends any Acquisition Proposal;
    - Synlogic enters into any letter of intent or similar document or any contract relating to any Acquisition Proposal, other than a confidentiality agreement permitted pursuant to the Merger Agreement; or
    - Synlogic or any director, officer or agent of Synlogic willfully and intentionally breaches the non-solicitation provisions or the provisions regarding the Synlogic Stockholder written consent set forth in the Merger Agreement;
- by Mirna or Synlogic if the other party has breached any of its representations, warranties, covenants or agreements contained in the Merger Agreement or if any representation or warranty of the other party

has become inaccurate, in either case such that the conditions to the Closing would not be satisfied as of time of such breach or inaccuracy, but if such breach or inaccuracy is curable, then the Merger Agreement will not terminate pursuant to this provision as a result of a particular breach or inaccuracy until the earlier of the expiration of a 30-day period after delivery of written notice of such breach or inaccuracy and the breaching party ceasing to exercise commercially reasonable efforts to cure such breach, if such breach has not been cured;

- by Mirna, at any time prior to the approval by Mirna Stockholders of the Merger Agreement and the transactions contemplated by the Merger Agreement, including the issuance of shares of Mirna Common Stock to Synlogic Stockholders in the Merger, if the Mirna Board of Directors authorizes Mirna to enter into any alternative agreement; provided that Mirna shall not enter into such alternative agreement unless (i) Synlogic shall have received written notice from Mirna of its intention to enter into such alternative agreement at least four business days in advance, with such notice describing the reasons for such intention as well as the material terms and conditions of such alternative agreement, including the identity of the counterparty and the then current draft of the alternative agreement, (ii) Mirna shall have complied in all material respects with the non-solicitation provisions or the provisions regarding the Mirna Stockholder vote set forth in the Merger Agreement, (iii) the Mirna Board of Directors shall have determined in good faith, after consultation with its outside legal counsel, that he failure to enter into such alternative agreement would be inconsistent with its fiduciary duties under applicable law and (iv) Mirna shall concurrently pay to Synlogic a termination fee of $2.0 million; and
- by Synlogic, at any time after the date of the Merger Agreement and prior to the Closing, if Mirna's net cash balance has fallen below $33.5 million, such that the minimum net cash condition to closing in the Merger Agreement would not be satisfied as of such time and such deficiency is not reasonably capable of being cured prior to the closing date.

Termination Fee

Fee payable by Mirna

Mirna must pay Synlogic a termination fee of $2.0 million if:

- (a) (i) the Merger Agreement is terminated by either Mirna or Synlogic if the Annual Meeting shall have been held and completed and the Mirna Stockholders shall have not approved the Merger Agreement or the transactions contemplated by the Merger Agreement, including the issuance of shares of Mirna Common Stock to Synlogic Stockholders in the Merger, (ii) the Merger Agreement is terminated by Synlogic because Mirna or Merger Sub has breached any of its representations, warranties, covenants or agreements contained in the Merger Agreement or if any representation or warranty of Mirna or Merger Sub has become inaccurate, in either case such that the conditions to the Closing would not be satisfied as of the time of such breach or inaccuracy, subject to a 30-day cure period or (iii) the Merger Agreement is terminated by Synlogic if the Merger is not consummated by the End Date, (b) at any time after the date of Merger Agreement and prior to the Annual Meeting an Acquisition Proposal with respect to Mirna was publicly announced, disclosed or otherwise communicated to the Mirna Board of Directors, and (c) within 12 months after the date of such termination, Mirna enters into a definitive agreement for or consummates an Acquisition Transaction;
- the Merger Agreement is terminated by Mirna, at any time prior to the Mirna Stockholders' approval of the Merger Agreement and the transactions contemplated by the Merger Agreement if the Mirna Board of Directors authorizes Mirna to enter into an alternative agreement; or
- the Merger Agreement is terminated by Synlogic at any time prior to the approval of the Merger Agreement and the transactions contemplated by the Merger Agreement by the Mirna Stockholders upon the occurrence of a Meerkat Triggering Event.

Mirna must reimburse Synlogic for expenses incurred by Synlogic in connection with the Merger Agreement and the transactions contemplated thereby, up to a maximum of $1.0 million, if:

- the Merger Agreement is terminated by Synlogic if (a) the Annual Meeting shall have been held and completed, (b) the Mirna Stockholders shall have not approved the Merger Agreement and the transactions contemplated by the Merger Agreement, including the issuance of shares of Mirna Common Stock to Synlogic Stockholders in the Merger;
- the Merger Agreement is terminated by Synlogic because Mirna or Merger Sub has breached any of its representations, warranties, covenants or agreements contained in the Merger Agreement or if any representation or warranty of Mirna or Merger Sub has become inaccurate, in either case such that the conditions to the Closing would not be satisfied as of the time of such breach or inaccuracy, subject to a 30-day cure period;
- the Merger Agreement is terminated by Synlogic because Mirna's net cash balance has fallen below $33.5 million, such that the minimum net cash condition to the Closing would not be satisfied as of such time and such deficiency is not reasonably capable of being cured prior to the closing date; or
- in the event of a failure by Synlogic to consummate the transactions described in the Merger Agreement solely as a result of a Meerkat Material Adverse Effect, as defined in the section entitled "*The Merger Agreement—Conditions to the Completion of the Merger.*"

Fee payable by Synlogic

Synlogic must pay Mirna a termination fee of $2.0 million if:

- the Merger Agreement is terminated by Mirna if (a) the required approval of Synlogic Stockholders has not been obtained within two business days of the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, being declared effective by the SEC, (b) at any time after the date of the Merger Agreement and prior to obtaining the approval of the Synlogic Stockholders, an Acquisition Proposal with respect to Synlogic was publicly announced, disclosed or otherwise communicated to the Synlogic Board of Directors and (c) within 12 months after the date of such termination, Synlogic enters into a definitive agreement for or consummates an Acquisition Transaction; or
- the Merger Agreement is terminated by Mirna at any time prior to the adoption of the Merger Agreement, and approval of the Merger and the other transactions contemplated by the Merger Agreement, by the Synlogic Stockholders upon the occurrence of a Synlogic Triggering Event.

Synlogic must reimburse Mirna for expenses incurred by Mirna in connection with the Merger Agreement and the transactions contemplated thereby, up to a maximum of $1.0 million, if:

- the Merger Agreement is terminated by Mirna if the required approval of Synlogic Stockholders has not been obtained within two business days of the registration statement on Form S-4, of which this proxy statement/prospectus/information statement is a part, being declared effective by the SEC;
- the Merger Agreement is terminated by Mirna because Synlogic has breached any of its representations, warranties, covenants or agreements contained in the Merger Agreement or if any representation or warranty of Synlogic has become inaccurate, in either case such that the conditions to the Closing would not be satisfied as of the time of such breach or inaccuracy, subject to a 30-day cure period; or
- in the event of a failure by Mirna to consummate the transactions described in the Merger Agreement solely as a result of the occurrence of a Company Material Adverse Effect, as defined above in the section entitled "*The Merger Agreement—Conditions to the Completion of the Merger.*"

Amendment

The Merger Agreement may be amended with the approval of the respective boards of directors of Mirna, Synlogic and Merger Sub at any time, except that after the Merger Agreement has been adopted and approved by the Mirna Stockholders or Synlogic Stockholders, no amendment which by law requires further approval by the Mirna Stockholders or Synlogic Stockholders, as the case may be, shall be made without such further approval.

AGREEMENTS RELATED TO THE MERGER

Support Agreements

In order to induce Mirna to enter into the Merger Agreement, certain Synlogic Stockholders are parties to a support agreement with Mirna pursuant to which, among other things, each stockholder has agreed, solely in his, her or its capacity as a Synlogic Stockholder, to vote all of his, her or its shares of Synlogic Capital Stock in favor of the adoption of the Merger Agreement, the approval of the transactions contemplated thereby, including the Merger and the approval of any other matter necessary to consummate the transactions contemplated by the Merger Agreement that are considered and voted upon by the Synlogic Stockholders and against any Acquisition Proposal. These Synlogic Stockholders have also granted Mirna an irrevocable proxy to vote their respective shares of Synlogic Capital Stock in accordance with the support agreements. The Synlogic Stockholders may vote their shares of Synlogic Capital Stock on all other matters not referred to in such proxy.

The parties to the support agreements with Mirna are include all directors and executive officers of Synlogic and certain major stockholders of Synlogic, including Atlas Venture Fund IX, L.P., New Enterprise Associates 14, L.P., OrbiMed Private Investments VI, L.P. and Deerfield Private Design Fund III, L.P.

As of May 31, 2017, the Synlogic Stockholders that are party to a support agreement with Mirna owned an aggregate of 3,861,498 shares of Synlogic Common Stock and 14,649,540 shares of Synlogic Preferred Stock, representing approximately 77% of the outstanding shares of Synlogic Capital Stock on an as converted to common stock basis. These stockholders include executive officers and directors of Synlogic, as well as certain other stockholders owning a significant portion of the outstanding shares of Synlogic Capital Stock. Following the effectiveness of the registration statement on Form S-4 of which this proxy statement/prospectus/information statement is a part and pursuant to the Merger Agreement, Synlogic Stockholders holding a sufficient number of shares of Synlogic Capital Stock to adopt the Merger Agreement and approve the Merger and related transactions will execute written consents providing for such adoption and approval. Therefore, holders of a sufficient number of shares of Synlogic Capital Stock required to adopt the Merger Agreement and approve the Merger and related transactions are contractually obligated to adopt the Merger Agreement are expected to adopt the Merger Agreement via written consent.

Under these support agreements, subject to certain exceptions, such stockholders have also agreed not to sell or transfer their shares of shares of Synlogic Capital Stock and securities convertible into shares of Synlogic Capital Shock held by them, or any voting rights with respect thereto, until the earlier of the termination of the Merger Agreement and the completion of the Merger, subject to certain exceptions. To the extent that any such sale or transfer is permitted pursuant to the exceptions included in the support agreement, each person to which any shares of Synlogic Capital Stock or securities convertible into shares of Synlogic Capital Stock are so sold or transferred must agree in writing to be bound by the terms and provisions of the support agreement.

In addition, in order to induce Synlogic to enter into the Merger Agreement, certain Mirna Stockholders have entered into support agreements with Synlogic pursuant to which, among other things, each such stockholder has agreed, solely in his, her or its capacity as a Mirna Stockholder, to vote all of his, her or its shares of Mirna Common Stock in favor of (i) the Merger Agreement and the transactions contemplated thereby, including the Merger and the issuance of Mirna Common Stock to Synlogic Stockholders, (ii) an amendment to the amended and restated certificate of incorporation of Mirna to effect the Mirna Reverse Stock Split, (iii) an amendment to the amended and restated certificate of incorporation of Mirna to effect the Mirna Name Change, (iv) any proposal to adjourn or postpone the meeting to a later date, if there are not sufficient votes for the approval of the other matters to be approved on date of the Annual Meeting, and (v) any other matter necessary to consummate the transactions contemplated by the Merger Agreement that are considered and voted upon by Mirna Stockholders at the Annual Meeting and against any Acquisition Proposal. These Mirna Stockholders have also granted Synlogic an irrevocable proxy to vote their respective shares of Mirna Common Stock in accordance with the support agreements. Mirna Stockholders may vote their shares of Mirna Common Stock on all other matters not referred to in such proxy.

The parties to the support agreements with Synlogic are:

- Sofinnova Venture Partners VIII, L.P.
- New Enterprise Associates 14, L.P.
- Lawrence M. Alleva
- Paul Lammers, M.D., M.Sc.
- Edward Mathers
- Michael Powell, Ph.D.
- Matthew Winkler, Ph.D.

As of May 31, 2017, the Mirna Stockholders that are party to a support agreement beneficially owned an aggregate of 7,061,006 shares of Mirna Common Stock representing approximately 33% of the outstanding shares of Mirna Common Stock. These stockholders include executive officers and directors of Mirna and certain other Mirna Stockholders holding a significant portion of the outstanding shares of Mirna Common Stock.

Under these support agreements, subject to certain exceptions, such stockholders have also agreed not to sell or transfer their shares of Mirna Common Stock and securities convertible into shares of Mirna Common Stock held by them until the earlier of the termination of the Merger Agreement and the completion of the Merger, subject to certain exceptions. To the extent that any such sale or transfer is permitted pursuant to the exceptions included in the support agreements, each person to which any shares of Mirna Common Stock or securities convertible into shares of Mirna Common Stock are so sold or transferred must agree in writing to be bound by the terms and provisions of the support agreement, subject to certain further exceptions with respect to certain Mirna Stockholders.

Lock-up Agreements

As a condition to the Closing, certain Mirna Stockholders and Synlogic Stockholders have entered into lock-up agreements, pursuant to which such parties have agreed not to, except in limited circumstances, sell or transfer, or engage in swap or similar transactions with respect to, shares of Mirna Common Stock, including, as applicable, shares received in the Merger and issuable upon exercise of certain options, in each case from the Closing until the date that is 180 days from the Closing.

As of May 31, 2017, Mirna Stockholders who have executed lock-up agreements beneficially owned in the aggregate approximately 33% of the outstanding Mirna Common Stock.

Synlogic Stockholders who have executed lock-up agreements as of May 31, 2017, owned in the aggregate approximately 81% of the outstanding shares of Synlogic Capital Stock on an as if converted into common stock basis.

MIRNA DIRECTORS, OFFICERS AND CORPORATE GOVERNANCE

Executive Officers of Mirna

The following table sets forth information regarding Mirna's executive officers and directors as of May 31, 2017:

Name	Age	Position/Office Held with Mirna
Paul Lammers, M.D., M.Sc.	59	President and Chief Executive Officer, Director
Alan Fuhrman	60	Chief Financial Officer
Casi DeYoung	46	Chief Business Officer

Paul Lammers, M.D., M.Sc. Dr. Lammers has served as a member of the Mirna Board of Directors and as Mirna's President and Chief Executive Officer since November 2009. Previously, Dr. Lammers was the President of Repros Therapeutics Inc., a biopharmaceutical company, from February 2009 until October 2009. From August 2002 until September 2008, Dr. Lammers served as the Chief Medical Officer for EMD Serono, Inc., a biopharmaceutical division of Merck KGaA, a global pharmaceutical and chemical group. Previously, Dr. Lammers served as the Senior Vice President of clinical and regulatory affairs at Zonagen, Inc., which later became Repros Therapeutics Inc. Dr. Lammers began his career with Organon International, a pharmaceutical company, spending eight years in the commercial and clinical operations in Europe and the United States. Dr. Lammers received a M.Sc. and M.D. from the Catholic University (Radboud University) in Nijmegen, The Netherlands. Dr. Lammers has been chosen to serve on the Mirna Board of Directors due to his management experience in multiple pharmaceutical and biopharmaceutical companies and drug development.

Alan Fuhrman. Mr. Fuhrman has served as Mirna's Chief Financial Officer since September 2015. Mr. Fuhrman previously served as the Chief Financial Officer of Ambit Biosciences Corporation, a biopharmaceutical company, from October 2010 through Mirna's initial public offering in 2013 and until its sale to Daiichi Sankyo for up to $410 million. Prior to this role, Mr. Fuhrman served as Chief Financial Officer of Naviscan, Inc., a privately-held medical imaging company, from November 2008 until September 2010, and as Chief Financial Officer of Sonus Pharmaceuticals, Inc., a pharmaceutical company, from September 2004 until August 2008. Mr. Fuhrman is a member of the board of directors of Loxo Oncology, Inc., a biopharmaceutical company. Earlier in Mr. Fuhrman's career he practiced as a CPA with Coopers and Lybrand. Mr. Fuhrman received a B.S. in both Business Administration and Agricultural Economics from Montana State University.

Casi DeYoung. Ms. DeYoung has served as Mirna's Chief Business Officer since March 2014. From May 2008 to December 2013, Ms. DeYoung served as the Vice President of Business Development for Reata Pharmaceuticals, Inc., a biopharmaceutical company. Previously, Ms. DeYoung served as the Vice President of Business Development for ODC Therapy, Inc., an immunotherapy company. From 2000 to 2005, Ms. DeYoung served in various roles, including the Director of Global Oncology Operations, for EMD Pharmaceuticals, Inc., the U.S. affiliate of Merk KGaA, a global healthcare company. Ms. DeYoung received a B.S. in Chemistry from Southwestern University and an M.B.A. from the University of Texas at Austin.

Directors of Mirna

The following table sets forth information regarding Mirna's directors as of May 31, 2017:

Name	Age	Position/Office Held with Mirna	Director Since	Director Term Expires
Paul Lammers, M.D., M.Sc.	59	President and Chief Executive Officer, Director	2009	2018
Lawrence M. Alleva	67	Director	2014	2017
Peter S. Greenleaf	47	Director	2016	2019
Edward Mathers	57	Director	2012	2018
Perry Nisen, M.D., Ph.D.	61	Director	2016	2019
Michael Powell, Ph.D.	62	Director	2012	2017
Matthew Winkler, Ph.D.	64	Director	2007	2019

Dr. Lammers' biographical information is set forth above under the section entitled "*Mirna Directors, Officers and Corporate Governance—Executive Officers of Mirna.*"

Lawrence M. Alleva. Mr. Alleva joined the Mirna Board of Directors in July 2014. Prior to his retirement in June 2010, Mr. Alleva worked with PricewaterhouseCoopers LLP ("PwC"), for 39 years, 28 of which as a partner with the firm. Mr. Alleva served clients primarily in the technology sector, including numerous pharmaceutical and biotechnology companies. Additionally, he served PwC in a variety of office, regional and national practice leadership roles, most recently as the U.S. Ethics and Compliance Leader (Assurance) for PwC from 2006 until his retirement. Mr. Alleva is a Certified Public Accountant (inactive). Mr. Alleva received a B.S. from Ithaca College (magna cum laude) and attended Columbia University's Executive MBA program. Mr. Alleva also serves as a director for public companies Tesaro Inc., Bright Horizons Family Solutions, and Adaptimmune Ltd., and previously served on the board of GlobalLogic Inc. Mr. Alleva has been chosen to serve on the Mirna Board of Directors due to his financial and accounting experience as a director and a public accounting partner serving multiple healthcare, pharmaceutical and biopharmaceutical companies.

Peter S. Greenleaf. Mr. Greenleaf has served on the Mirna Board of Directors since March 2016. He has been the Chief Executive Officer and a Director of Sucampo Pharmaceuticals, Inc., a biopharmaceutical company ("Sucampo"), since March 2014 and was appointed chairman of the board in January 2016. In addition, Mr. Greenleaf is currently a Director of Mast Therapeutics, Inc., a biopharmaceutical company, and has served since November 2015. Prior to his leadership of Sucampo, Mr. Greenleaf was CEO and a board member of Histogenics Corporation, a regenerative medicine company, from June 2013 through February 2014. From April 2006 to June 2013, Mr. Greenleaf was employed by MedImmune LLC ("MedImmune"), the global biologics arm of AstraZeneca plc ("AstraZeneca"), a biopharmaceutical company, where he most recently served as President. While at MedImmune, Mr. Greenleaf was instrumental in driving the expansion of MedImmune's pipeline into over 120 clinical and pre-clinical programs and the commercialization of its marketed products. Mr. Greenleaf also served as President of MedImmune Ventures, Inc., a venture capital subsidiary of MedImmune, from January 2010 to June 2013, a wholly owned venture capital fund within the AstraZeneca Group, where he led investment in emerging biopharmaceutical, medical device, and diagnostic companies. Prior to serving as President of MedImmune, Mr. Greenleaf was the Chief Commercial Officer of MedImmune, responsible for its commercial, corporate development and strategy functions. Mr. Greenleaf has also held senior commercial roles at Centocor Biotech, Inc. (now Jansen Biotech, Inc.), a biotechnology company, from 1998 to 2006 and prior to that Boehringer Mannheim G.m.b.H. (now Roche Holdings), a pharmaceutical company, from 1996 to 1998. Mr. Greenleaf currently chairs the Maryland Venture Fund Authority, whose vision is to oversee implementation of InvestMaryland, a public-private partnership to spur venture capital investment in the state. Mr. Greenleaf is also a member of the board of directors of the Biotechnology Industry Organization (BIO), where he also serves on the Governing Board of the Emerging Companies Section. He is also a member of the board of directors of the Pharmaceutical Research and Manufacturers of America (PhRMA). Mr. Greenleaf's previous Board appointments include the University of Maryland Baltimore Foundation, Inc.; Rib-X Pharmaceuticals, biopharmaceutical company; LigoCyte Pharmaceuticals, a biopharmaceutical company (acquired by Takeda

Pharmaceutical Company Limited in 2012); and Corridor Pharmaceuticals, a biopharmaceutical company. He received an M.B.A. from St. Joseph's University and a B.S. from Western Connecticut State University. Mr. Greenleaf has been chosen to serve on the Mirna Board of Directors due to his leadership experience and extensive commercialization, strategic planning, and drug development experience in the biopharmaceutical industry.

Edward Mathers. Mr. Mathers has served as a member of the Mirna Board of Directors since October 2012. Since 2008, Mr. Mathers has been a Partner at New Enterprise Associates, Inc. ("NEA"), a private venture capital firm focusing on technology and healthcare investments. Mr. Mathers serves on the board of directors of the following pharmaceutical companies: Amplyx Pharmaceuticals, Inc., ObsEva SA, Synlogic, Ziarco Group Limited, Envisia Therapeutics, Inc., Ra Pharmaceuticals, Inc., Rhythm Pharmaceuticals, and Lumos Pharma. Mr. Mathers also serves on the board of directors of Liquidia Technologies, a biotechnology company. From 2002 to 2008, Mr. Mathers served as Executive Vice President, Corporate Development and Venture at MedImmune, a biopharmaceutical company, and led its venture capital subsidiary, MedImmune Ventures, Inc. Before joining MedImmune in 2002, he was Vice President, Marketing and Corporate Licensing and Acquisitions at Inhale Therapeutic Systems, a biotechnology company. Previously, Mr. Mathers spent 15 years at Glaxo Wellcome, Inc. (now GlaxoSmithKline plc), a pharmaceutical company, where he held various sales and marketing positions. Mr. Mathers received a B.S. in Chemistry from North Carolina State University. Mr. Mathers has been chosen to serve on the Mirna Board of Directors due to his experience with the healthcare and pharmaceutical industries and his broad management experience.

Perry Nisen, M.D., Ph.D. Dr. Nisen has served as a member of the Mirna Board of Directors since June 2016. He has been Chief Executive Officer of Sanford Burnham Prebys Medical Discovery Institute, a non-profit medical research institute, since August 2014 and holds the Donald Bren Chief Executive Chair. From June 2004 to September 2014, Dr. Nisen served in various roles at GlaxoSmithKline plc ("GlaxoSmithKline"), a pharmaceutical company, including most recently Senior Vice President of Science and Innovation, as well as Chief Medical Officer, Senior Vice President and Oncology Therapy Area Head, Senior Vice President of Cancer Research, Senior Vice President of Clinical Pharmacology and Discovery Medicine. Before that, Dr. Nisen was Divisional Vice President of Cancer Research and Oncology Development at Abbott Laboratories, Inc., a healthcare company. Dr. Nisen holds a B.S. from Stanford University and M.D. and Ph.D. degrees from the Albert Einstein College of Medicine. Dr. Nisen has been chosen to serve on the Mirna Board of Directors because of his medical and scientific expertise, experience in the healthcare industry and broad management experience.

Michael Powell, Ph.D. Dr. Powell has served as Chairman of the Mirna Board of Directors since October 2012. Since 1997, Dr. Powell has been a General Partner of Sofinnova Ventures, a venture capital firm. Previously, Dr. Powell has held positions at Genentech, Inc., a biotechnology company, Cytel Inc., a research and development company, and Syntex Research Group, a pharmaceutical company. Dr. Powell is currently a director of biopharmaceutical companies Dauntless Pharmaceuticals, Inc., Alvine Pharmaceuticals, Inc., Ascenta Therapeutics, Inc., Checkmate Pharmaceuticals, Inc., Dauntless 1, Inc. and Ocera Therapeutics, Inc. Dr. Powell is an Adjunct Professor at the University of Kansas. He is the Board President of the AIDS Vaccine Advocacy Coalition and serves on the advisory board of the Institute for the Advancement of Medical Innovation at the University of Kansas. Dr. Powell received a B.S. in Chemistry from Scarborough College, a Ph.D. in Physical Chemistry from the University of Toronto and completed his post-doctorate work in Bioorganic Chemistry at the University of California. Dr. Powell has been chosen to serve on the Mirna Board of Directors due to his experience with the life sciences and pharmaceutical industries and the venture capital industry.

Matthew Winkler, Ph.D. Dr. Winkler is Mirna's founder and has served as a member of the Mirna Board of Directors since December 2007, including as Chairman until October 2012. During 2008 to 2009, Dr. Winkler served as Mirna's Executive Chairman. Since January 2013, Dr. Winkler has been the Chairman of the board of directors of Asuragen, a molecular diagnostic and pharmacogenomics service company, where he also served as the Chief Executive Officer from 2006 to December 2012. Prior to Asuragen, Dr. Winkler was the founder and

Chief Executive Officer of Ambion, Inc., a privately held company that developed and sold research reagents for RNA analysis. Until March 2016, Dr. Winkler served on the board of Second Genome, a biotherapeutics company. Dr. Winkler received a B.S. in Genetics and a Ph.D. in Zoology from the University of California at Berkeley. Dr. Winkler was an Assistant and Associate Professor of Zoology at the University of Texas from 1983 to 1991. Dr. Winkler has been chosen to serve on the Mirna Board of Directors due to his management experience in the life sciences and pharmaceutical industries.

Board Composition

Director Independence

The Mirna Board of Directors currently consists of seven members. The Mirna Board of Directors has determined that all of the directors, other than Dr. Paul Lammers, qualify as "independent" directors in accordance with NASDAQ listing requirements. Dr. Lammers is not considered independent because he is an employee of Mirna. The NASDAQ independence definition includes a series of objective tests, such as that the director is not, and has not been for at least three years, one of Mirna's employees and that neither the director nor any of his family members has engaged in various types of business dealings with Mirna. In addition, as required by NASDAQ rules, the Mirna Board of Directors has made a subjective determination as to each independent director that no relationships exist, which, in the opinion of the Mirna Board of Directors, would interfere with the exercise of independent judgment in carrying out the responsibilities of a director. In making these determinations, the Mirna Board of Directors reviewed and discussed information provided by the directors and Mirna with regard to each director's business and personal activities and relationships as they may relate to Mirna and its management. There are no family relationships among any of Mirna's directors or executive officers.

As required under NASDAQ rules and regulations, Mirna's independent directors meet in regularly scheduled executive sessions at which only independent directors are present.

Classified Board of Directors

In accordance with Mirna's amended and restated certificate of incorporation, the Mirna Board of Directors is divided into three classes with staggered, three-year terms as set forth below. At each annual meeting of stockholders, the successors to directors whose terms then expire will be elected to serve from the time of election and qualification until the third annual meeting following election.

- The Class I directors are Dr. Winkler, Mr. Greenleaf and Dr. Nisen, and their terms will expire at the 2019 annual meeting of stockholders;
- The Class II directors are Mr. Alleva and Dr. Powell, and their terms will expire at the Annual Meeting; and
- The Class III directors are Dr. Lammers and Mr. Mathers, and their terms will expire at 2018 annual meeting of stockholders.

The authorized number of directors may be changed only by resolution of the Mirna Board of Directors. Any additional directorships resulting from an increase in the number of directors will be distributed among the three classes so that, as nearly as possible, each class will consist of one-third of the directors. The division of the Mirna Board of Directors into three classes with staggered three-year terms may delay or prevent a change of management or a change in control of Mirna.

Leadership Structure of the Board

The Mirna Board of Directors has separated the positions of Chairman of the Mirna Board of Directors and Chief Executive Officer. Separating these positions allows Mirna's Chief Executive Officer to focus on Mirna's

day-to-day business, while allowing the Chairman of the Mirna Board of Directors to lead the board in its fundamental role of providing advice to and independent oversight of management. The Mirna Board of Directors recognizes the time, effort and energy that the Chief Executive Officer is required to devote to such position in the current business environment, as well as the commitment required to serve as Chairman of the Mirna Board of Directors, particularly as the board's oversight responsibilities continue to grow. While Mirna's bylaws and corporate governance guidelines do not require that the Chairman and Chief Executive Officer positions be separate, the Mirna Board of Directors believes that having separate positions and having an independent outside director serve as Chairman is the appropriate leadership structure for Mirna and demonstrates Mirna's commitment to good corporate governance. However, the Mirna Board of Directors will continue to periodically review Mirna's leadership structure and may make such changes in the future as it deems appropriate.

Role of Board in Risk Oversight Process

Risk assessment and oversight are an integral part of Mirna's governance and management processes. The Mirna Board of Directors encourages management to promote a culture that incorporates risk management into Mirna's corporate strategy and day-to-day business operations. Management discusses strategic and operational risks at regular management meetings, and conducts specific strategic planning and review sessions during the year that include a focused discussion and analysis of the risks facing us. Throughout the year, senior management reviews these risks with the Mirna Board of Directors at regular board meetings as part of management presentations that focus on particular business functions, operations or strategies, and presents the steps taken by management to mitigate or eliminate such risks.

The Mirna Board of Directors does not have a standing risk management committee, but rather administers this oversight function directly through the board of directors as a whole, as well as through various standing committees of the board of directors that address risks inherent in their respective areas of oversight. In particular, the Mirna Board of Directors is responsible for monitoring and assessing strategic risk exposure, the audit committee is responsible for overseeing Mirna's major financial risk exposures and the steps management has taken to monitor and control these exposures. The audit committee also monitors compliance with legal and regulatory requirements. Mirna's nominating and governance committee monitors the effectiveness of Mirna's corporate governance guidelines and considers and approves or disapproves any related-persons transactions. The compensation committee assesses and monitors whether any of Mirna's compensation policies and programs has the potential to encourage excessive risk-taking.

Meetings of the Board of Directors and Committees

During 2016, the Mirna Board of Directors met seven times and acted by unanimous written consent one time. The audit committee met five times, the compensation committee met four times and acted by unanimous written consent two times and the nominating and corporate governance committee met one time. In that year, each incumbent director attended at least 75% of the meetings of the Mirna Board of Directors and the committees on which such director served.

Board Committees

Audit Committee

The audit committee oversees Mirna's corporate accounting and financial reporting process. Among other matters, the audit committee:

- appoints Mirna's independent registered public accounting firm;
- evaluates the independent registered public accounting firm's qualifications, independence and performance;

- determines the engagement of the independent registered public accounting firm;
- reviews and approves the scope of the annual audit and the audit fee;
- discusses with management and the independent registered public accounting firm the results of the annual audit and the review of Mirna's quarterly financial statements;
- approves the retention of the independent registered public accounting firm to perform any proposed permissible non-audit services;
- monitors the rotation of partners of the independent registered public accounting firm on Mirna's engagement team as required by law;
- is responsible for reviewing Mirna's financial statements and management's discussion and analysis of financial condition and results of operations to be included in Mirna's annual and quarterly reports to be filed with the SEC;
- reviews Mirna's critical accounting policies and estimates; and
- annually reviews the audit committee charter and the committee's performance.

The current members of Mirna's audit committee are Mr. Alleva, who serves as the chairman of the committee, Mr. Greenleaf and Dr. Nisen. Each of the members of the audit committee meets the requirements for financial literacy under the applicable rules and regulations of the SEC and NASDAQ. The Mirna Board of Directors has determined that Mr. Alleva is an audit committee financial expert as defined under the applicable rules of the SEC and has the requisite financial sophistication as defined under the applicable rules and regulations of NASDAQ. Under the rules of the SEC, members of the audit committee must also meet heightened independence standards. The Mirna Board of Directors has determined that each the members of the audit committee is independent under the heightened independence standards under the applicable rules of NASDAQ. The audit committee operates under a written charter that satisfies the applicable standards of the SEC and NASDAQ. A copy of the audit committee charter is available to security holders on Mirna's website at http://investor.mirnarx.com/corporate-governance.cfm.

Compensation Committee

Mirna's compensation committee reviews and recommends policies relating to compensation and benefits of Mirna's officers and employees. The compensation committee reviews and recommends corporate goals and objectives relevant to compensation of the Chief Executive Officer and other executive officers, evaluates the performance of these officers in light of those goals and objectives and recommends to the Mirna Board of Directors the compensation of these officers based on such evaluations. The compensation committee also recommends to the Mirna Board of Directors the issuance of stock options and other awards under Mirna's stock plans. The compensation committee will review and evaluate, at least annually, the performance of the compensation committee and its members, including compliance by the compensation committee with its charter.

The current members of Mirna's compensation committee are Dr. Powell, who serves as the chairperson of the committee, and Mr. Mathers. Each of the members of the compensation committee is independent under the applicable rules and regulations of NASDAQ, is a "non-employee director" as defined in Rule 16b-3 promulgated under the Exchange Act and is an "outside director" as that term is defined in Section 162(m) of the Code. The compensation committee operates under a written charter that satisfies the applicable standards of the SEC and NASDAQ. A copy of the compensation committee charter is available to security holders on Mirna's website at http://investor.mirnarx.com/corporate-governance.cfm.

Mirna's compensation committee has retained Radford, Inc. ("Radford"), a nationally-recognized compensation consulting firm, to serve as its independent compensation consultant and to conduct market research and analysis on Mirna's various executive positions, to assist the committee in developing appropriate

incentive plans for Mirna's executives on an annual basis, to provide the committee with advice and ongoing recommendations regarding material executive compensation decisions, and to review compensation proposals of management. Radford reports directly to the compensation committee and does not provide any non-compensation related services to Mirna. In compliance with the disclosure requirements of the SEC regarding the independence of compensation consultants, Radford addressed each of the six independence factors established by the SEC with Mirna's compensation committee. Its responses affirmed the independence of Radford on executive compensation matters. Based on this assessment, the compensation committee determined that the engagement of Radford does not raise any conflicts of interest or similar concerns. In addition, the compensation committee evaluated the independence of its other outside advisors to the compensation committee, including outside legal counsel, considering the same independence factors and concluded their work for the compensation committee does not raise any conflicts of interest.

Nominating and Corporate Governance Committee

The nominating and corporate governance committee is responsible for making recommendations to the Mirna Board of Directors regarding candidates for directorships and the size and composition of the Mirna Board of Directors. In addition, the nominating and corporate governance committee is responsible for overseeing Mirna's corporate governance policies and reporting and making recommendations to the Mirna Board of Directors concerning governance matters.

The current members of the nominating and corporate governance committee are Mr. Mathers, who serves as the chairman of the committee, and Mr. Alleva. Each of the members of the nominating and corporate governance committee is an independent director under the applicable rules and regulations of NASDAQ relating to nominating and corporate governance committee independence. The nominating and corporate governance committee operates under a written charter. A copy of the nominating and corporate governance committee charter is available to security holders on Mirna's website at http://investor.mirnarx.com/corporate-governance.cfm.

The nominating and corporate governance committee will consider director candidates recommended by Mirna Stockholders. For a Mirna Stockholder to make any recommendation or nomination for election to the Mirna Board of Directors at an annual meeting, the Mirna Stockholder must provide notice to Mirna's Corporate Secretary, which notice must be delivered to, or mailed and received at, Mirna's principal executive offices not less than 90 days and not more than 120 days prior to the one-year anniversary of the preceding year's annual meeting. However, if the date of the 2018 annual meeting of stockholders is more than 30 days before or more than 60 days after [●], 2018, then such notice must be given no later than the 90th day prior to that meeting or, if later, the 10th day following the day on which public disclosure of that annual meeting date is first made. Further updates and supplements to such notice may be required at the times, and in the forms, required under Mirna's bylaws. As set forth in Mirna's bylaws, submissions must include the name and address of the proposed nominee, information regarding the proposed nominee that is required to be disclosed in a proxy statement or other filings in a contested election pursuant to Section 14(a) under the Exchange Act, information regarding the proposed nominee's indirect and direct interests in shares of Mirna Common Stock, and a completed and signed questionnaire, representation and agreement of the proposed nominee. Mirna's bylaws also specify further requirements as to the form and content of a stockholder's notice. Mirna recommends that any Mirna Stockholder wishing to make a nomination for director review a copy of Mirna's bylaws, as amended and restated to date, which is available, without charge, from Mirna's Corporate Secretary at Mirna Therapeutics Inc., PO Box 163387, Austin, TX 78716.

Board Diversity

Mirna's nominating and corporate governance committee is responsible for reviewing with the Mirna Board of Directors, on an annual basis, the appropriate characteristics, skills and experience required for the Mirna Board of Directors as a whole and its individual members. In evaluating the suitability of individual candidates

(both new candidates and current members), the nominating and corporate governance committee, in recommending candidates for election (and, in the case of vacancies, appointing), and the Mirna Board of Directors, in approving such candidates, will take into account many factors, including the following:

- personal and professional integrity;
- ethics and values;
- experience in corporate management, such as serving as an officer or former officer of a publicly held company;
- experience in the industries in which Mirna competes;
- experience as a board member or executive officer of another publicly held company;
- diversity of expertise and experience in substantive matters pertaining to Mirna's business relative to other board members;
- conflicts of interest; and
- practical and mature business judgment.

Currently, the Mirna Board of Directors evaluates each individual in the context of the Mirna Board of Directors as a whole, with the objective of assembling a group that can best maximize the success of the business and represent stockholder interests through the exercise of sound judgment using its diversity of experience in these various areas.

Code of Business Conduct and Ethics

Mirna has adopted a code of business conduct and ethics that applies to all of its employees, officers and directors, including those officers responsible for financial reporting. The code of business conduct and ethics is available on Mirna's website at http://investor.mirnarx.com/corporate-governance.cfm. Mirna will disclose any substantive amendments to the code of business conduct and ethics, or any waiver of its provisions, on its website. The reference to the Mirna website does not constitute incorporation by reference of the information contained at or available through such website.

Limitation on Liability and Indemnification Matters

Mirna's amended and restated certificate of incorporation contains provisions that limit the liability of Mirna's directors for monetary damages to the fullest extent permitted by Delaware law. Consequently, Mirna's directors will not be personally liable to Mirna or Mirna Stockholders for monetary damages for any breach of fiduciary duties as directors, except liability for:

- any breach of the director's duty of loyalty to Mirna or Mirna Stockholders;
- any act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- unlawful payments of dividends or unlawful stock repurchases or redemptions as provided in Section 174 of the DGCL; or
- any transaction from which the director derived an improper personal benefit.

Mirna's amended and restated certificate of incorporation and amended and restated bylaws provide that Mirna is required to indemnify its directors and officers, in each case to the fullest extent permitted by Delaware law. The amended and restated bylaws also provide that Mirna is obligated to advance expenses incurred by a director or officer in advance of the final disposition of any action or proceeding, and permit Mirna to secure insurance on behalf of any officer, director, employee or other agent for any liability arising out of his or her actions in that capacity regardless of whether Mirna would otherwise be permitted to indemnify him or her under Delaware law.

Mirna has entered and expects to continue to enter into agreements to indemnify its directors, executive officers and other employees as determined by the Mirna Board of Directors. With specified exceptions, these agreements provide for indemnification for related expenses including, among other things, attorneys' fees, judgments, fines and settlement amounts incurred by any of these individuals in any action or proceeding brought against them by reason of the fact that they are or were Mirna's agents. Mirna believes that these provisions in Mirna's amended and restated certificate of incorporation and amended and restated bylaws and indemnification agreements are necessary to attract and retain qualified directors and officers. Mirna also maintains directors' and officers' liability insurance. This description of the limitation of liability and indemnification provisions of Mirna's amended and restated certificate of incorporation, amended and restated bylaws and indemnification agreements is qualified in its entirety by reference to these documents.

Director Attendance at Annual Meetings

The Mirna Board of Directors has a policy of encouraging director attendance at Mirna's annual meetings of stockholders, but attendance is not mandatory. The Mirna Board of Directors and management team encourage all of Mirna's directors to attend the Annual Meeting.

Section 16(a) Beneficial Ownership Reporting Compliance

Section 16(a) of the Exchange Act requires Mirna's directors and executive officers, and persons who own more than 10% of a registered class of Mirna's equity securities, to file with the SEC initial reports of ownership and reports of changes in ownership of Mirna Common Stock and other equity securities of Mirna. Officers, directors and greater than 10% stockholders are required by SEC regulations to furnish Mirna with copies of all Section 16(a) forms they file.

To Mirna's knowledge, based solely on a review of the copies of such reports furnished to Mirna and written representations that no other reports were required, during the year ended December 31, 2016, all Section 16(a) filing requirements applicable to Mirna's officers, directors and greater than 10% beneficial owners were complied with, except for Mr. Alleva, Mr. Greenleaf, Mr. Mathers, Dr. Nisen, Dr. Powell, Dr. Winkler and Dr. Siegall for whom Form 4 filings relating to grants made in connection with the 2016 annual meeting were filed late due to an administrative delay.

Director Compensation

Pursuant to the Director Compensation Program, as amended, Mirna's non-employee directors are entitled to receive cash compensation, paid quarterly in arrears, as follows:

- Each non-employee director receives an annual cash retainer in the amount of $35,000 per year.
- Any non-employee Chairman receives an additional annual cash retainer in the amount of $25,000 per year.
- The chairperson of the audit committee receives additional annual cash compensation in the amount of $15,000 per year for such chairperson's service on the audit committee. Each non-chairperson member of the audit committee receives additional annual cash compensation in the amount of $7,500 per year for such member's service on the audit committee.
- The chairperson of the compensation committee receives additional annual cash compensation in the amount of $10,000 per year for such chairperson's service on the compensation committee. Each non-chairperson member of the compensation committee receives additional annual cash compensation in the amount of $5,000 per year for such member's service on the compensation committee.
- The chairperson of the nominating and corporate governance committee receives additional annual cash compensation in the amount of $7,500 per year for such chairperson's service on the nominating

and corporate governance committee. Each non-chairperson member of the nominating and corporate governance committee receives additional annual cash compensation in the amount of $3,750 per year for such member's service on the nominating and corporate governance committee.

Under the Director Compensation Program, upon a director's initial appointment or election to the Mirna Board of Directors, such non-employee director will receive an option (the "Initial Grant") to purchase 20,000 shares of Mirna Common Stock (subject to adjustment as provided in the applicable equity plan). In addition, each non-employee director who has been serving as a director for at least three months prior to any annual stockholder meeting and who will continue to serve as a director immediately following such annual stockholder meeting will be automatically granted, on the date of such annual stockholder meeting, an option (the "Annual Grant") to purchase 10,000 shares of Mirna Common Stock (subject to adjustment as provided in the applicable equity plan). The Initial Grant will vest in substantially equal installments on each of the first three anniversaries of the applicable grant date, subject to continued service through each applicable vesting date, and the Annual Grant will vest in full on the earlier of the first anniversary of the applicable grant date or immediately prior to the next annual stockholder meeting after the applicable grant date, subject to continued service through such vesting date. In addition, pursuant to the terms of the Director Compensation Program, all equity awards outstanding and held by a non-employee director will vest in full immediately prior to the occurrence of a change in control.

Mirna reimburses all of its non-employee directors for all reasonable and customary business expenses incurred providing services to Mirna in accordance with company policy.

2016 Director Compensation Table

The following table sets forth information for the year ended December 31, 2016 regarding the compensation awarded to, earned by or paid to Mirna's non-employee directors:

Name	Fees earned or paid in cash($)	Option Awards ($)(1)(2)	Total($)
Michael Powell, Ph.D.	70,000	31,229	101,229
Lawrence M. Alleva	53,750	31,229	84,979
Peter S. Greenleaf	32,917	91,703	124,620
Edward Mathers	47,500	31,229	78,729
Perry Nisen, M.D., Ph.D.	21,250	64,400	85,650
Clay B. Siegall, Ph.D.(3)	47,500	31,229	78,729
Matthew Winkler, Ph.D.	35,000	31,229	66,229

(1) The amounts reported in the Option Awards column represent the grant date fair value of the stock options granted to the non-employee members of the Mirna Board of Directors during 2016 as computed in accordance with ASC Topic 718, excluding the impact of estimated forfeitures related to service-based vesting provisions. The assumptions used in calculating the grant date fair value of the stock options reported in the Option Awards column are set forth in Note 8 to the audited financial statements included this proxy statement/prospectus/information statement. Note that the amounts reported in this column reflect the accounting cost for these stock options, and do not correspond to the actual economic value that may be received by the non-employee members of the Mirna Board of Directors from the options.

(2) As of December 31, 2016, Mirna's non-employee directors held the following outstanding options to purchase Mirna Common Stock:

Name	Shares Underlying Outstanding Options
Michael Powell, Ph.D.	23,866
Lawrence M. Alleva	44,532
Peter S. Greenleaf	30,000
Edward Mathers	21,200
Perry Nisen, M.D., Ph.D.	20,000
Clay B. Siegall, Ph.D.(3)	32,420
Matthew Winkler, Ph.D.	21,200

(3) Effective December 31, 2016, Dr. Siegall resigned from the Mirna Board of Directors.

Compensation Committee Interlocks and Insider Participation

During 2016, Dr. Powell and Mr. Mathers served as members of Mirna's compensation committee. During 2016, none of the members of the compensation committee had at any time been one of Mirna's officers or employees. None of Mirna's executive officers currently serves, or in the past year has served, as a member of the board of directors or compensation committee of any entity that has one or more executive officers on the Mirna Board of Directors or compensation committee.

REPORT OF THE AUDIT COMMITTEE OF THE BOARD OF DIRECTORS

The material in this report is not "soliciting material," is not deemed "filed" with the SEC, and is not to be incorporated by reference into any filing of Mirna under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended.

The primary purpose of the audit committee is to oversee Mirna's financial reporting processes on behalf of the Mirna Board of Directors. The audit committee's functions are more fully described in its charter, which is available on the Mirna website at http://investor.mirnarx.com/corporate-governance.cfm.

In fulfilling its oversight responsibilities, the audit committee reviewed and discussed with management Mirna's audited financial statements for the calendar year ended December 31, 2016. The audit committee has discussed with Ernst & Young LLP ("EY"), Mirna's independent registered public accounting firm, the matters required to be discussed by Auditing Standard No. 16, "Communications with Audit Committees," issued by the Public Company Accounting Oversight Board ("PCAOB"). In addition, the audit committee has discussed with EY their independence, and received from EY the written disclosures and the letter required by Ethics and Independence Rule 3526 of the PCAOB. Finally, the audit committee discussed with EY, with and without management present, the scope and results of EY's audit of the financial statements for the calendar year ended December 31, 2016.

Based on these reviews and discussions, the audit committee has recommended to the Mirna Board of Directors that such audited financial statements be included in Mirna's Annual Report on Form 10-K for the year ended December 31, 2016 for filing with the SEC.

Audit Committee
Lawrence M. Alleva, Chairman
Peter S. Greanleaf
Perry Nisen, M.D., Ph.D.

MIRNA EXECUTIVE COMPENSATION

The following is a discussion and analysis of compensation arrangements of Mirna's named executive officers ("NEOs"). As an "emerging growth company," as defined in the JOBS Act, Mirna is not required to include a Compensation Discussion and Analysis section and has elected to comply with the scaled disclosure requirements applicable to emerging growth companies.

Mirna seeks to ensure that the total compensation paid to its executive officers is reasonable and competitive. Compensation of Mirna's executives is structured around the achievement of individual performance and near-term corporate targets as well as long-term business objectives.

Mirna's NEOs for calendar year 2016 were as follows:

- Paul Lammers, M.D., M.Sc., President and Chief Executive Officer;
- Alan Fuhrman, Chief Financial Officer;
- Vincent O'Neill, M.D., Former Chief Medical Officer;
- Miguel Barbosa, Ph.D., Former Chief Scientific Officer; and
- Jon Irvin, Former Vice President of Finance.

2016 Summary Compensation Table

The following table shows information regarding the compensation of Mirna's NEOs for services performed in the year ended December 31, 2016.

Name and Principal Position	Year	Salary ($)(1)	Bonus ($)(2)	Option Awards ($)(3)	Non-Equity Incentive Plan Compensation ($)	All Other Compensation ($)(4)	Total ($)
Paul Lammers, M.D., M.Sc.	2016	461,516	—	484,697	—	10,600	956,813
President and Chief Executive Officer	2015	387,625	135,700	1,045,503	128,885	10,600	1,708,313
Alan Fuhrman	2016	360,187	—	176,845	—	43,600	580,632
Chief Financial Officer	2015	86,250	—	825,840	24,425	25,407	961,922
Vincent O'Neill, M.D.(5)	2016	228,846	40,000	742,963	—	34,068	1,045,877
Former Chief Medical Officer							
Miguel Barbosa, Ph.D.(6)	2016	212,702	245,673	—	—	295,684	754,059
Former Chief Scientific Officer	2015	74,038	84,902	1,354,768	21,689	16,583	1,551,980
Jon Irvin(7)	2016	254,299	—	30,532	—	325,500	598,918
Former Vice President of Finance							

(1) The amount reported in the 2016 Salary column for Dr. Lammers, Alan Fuhrman and Jon Irvin is in excess of the executive's annual base salary because (i) it includes a pay out of accrued vacation following a change in Mirna's vacation policy and (ii) includes an additional week of salary being paid in 2016 following a change in payroll practice.

(2) The amounts reported in the Bonus column for Drs. O'Neill and Barbosa represent sign-on bonuses.

(3) For the Option Awards column, amounts reported represent the grant date fair value of stock options granted during calendar years 2016 and 2015, as well as incremental stock compensation expense of $813 for the acceleration of Mr. Irvin's option grants under his Separation Agreement as calculated in accordance with ASC Topic 718, excluding the impact of estimated forfeitures related to service based vesting provisions. See Note 8 to the audited financial statements included in this proxy statement/prospectus/information statement for the assumptions used in calculating this amount.

(4) The amounts reported in the All Other Compensation column represent: 401(k) plan matching contributions in the amount of $10,600, $10,600, $5,797, $8,415 and $10,600 Mirna made for Dr. Lammers, Mr. Fuhrman, Dr. O'Neill, Dr. Barbosa and Mr. Irvin respectively; $33,000 in temporary housing expenses Mirna reimbursed for Mr. Fuhrman; $28,271 in relocation reimbursements were paid to Dr. O'Neill, pursuant to his employment agreement, in connection with his relocation to the Austin, Texas area in April 2016, including $7,431 for travel expenses, $9,985 for moving expenses and $10,855 for mortgage interest expense reimbursement for his prior residence; $16,894 in relocation reimbursements for Dr. Barbosa, pursuant to his employment agreement, in connection with his relocation to the Austin, Texas area, including $2,411 for travel expenses and $14,483 for temporary housing; cash severance payments of $270,375 and $314,900 for Dr. Barbosa and Mr. Irvin, who was paid in January 2017, respectively.

(5) Dr. O'Neill resigned as Mirna's Chief Medical Officer effective as of May 19, 2017 and entered into a Separation Agreement with Mirna effective as of May 26, 2017. Please see a description of the Separation Agreement in the section of this proxy statement/prospectus/information statement entitled "*Narrative to 2016 Summary Compensation Table and Outstanding Equity Awards at 2016 Calendar Year End—Terms and Conditions of Vincent Neill's Separation Agreement.*"

(6) Dr. Barbosa resigned as Mirna's Chief Scientific Officer effective as of June 29, 2016 and entered into a Separation and Release Agreement with Mirna dated June 29, 2016. Please see a description of the Separation and Release Agreement in the section of this proxy statement/prospectus/information statement entitled "*Narrative to 2016 Summary Compensation Table and Outstanding Equity Awards at 2016 Calendar Year End-Terms and Conditions of Miguel Barbosa's Separation and Release Agreement.*"

(7) Mr. Irvin resigned as Mirna's Vice President of Finance effective as of December 2, 2016 and entered into a Separation Agreement with Mirna dated December 2, 2016. Please see a description of the Separation and Release Agreement in the section of this proxy statement/prospectus/information statement entitled "*Narrative to 2016 Summary Compensation Table and Outstanding Equity Awards at 2016 Calendar Year End—Terms and Conditions of Jon Irvin's Separation Agreement.*"

Outstanding Equity Awards at 2016 Calendar Year End

The following table sets forth all outstanding equity awards held by each of Mirna's NEOs as of December 31, 2016.

		Option Awards			
Name	Vesting Commencement Date(1)	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price ($)	Option Expiration Date
Paul Lammers, M.D., M.Sc.	(2)	10,565	—	7.50	12/31/2019
	(2)	116,211	—	1.65	1/10/2023
	3/6/2014	49,669	22,577	8.10	3/10/2024
	1/1/2015	9,583	10,416	6.15	3/1/2025
	5/1/2015(3)	54,861	76,805	6.45	6/4/2025
	9/30/2015	23,958	52,708	7.00	9/30/2025
	3/11/2016(3)	30,938	134,062	4.36	3/11/2026
Alan Fuhrman	9/30/2016	52,243	114,937	7.00	9/30/2025
	3/11/2016	—	60,000	4.36	3/11/2026
Vincent O'Neill, M.D.	4/25/2016	—	250,000	4.42	4/25/2026
Jon Irvin	(2)	6,563	—	1.65	6/6/2023
	(2)	13,795	—	4.35	12/30/2023
	(2)	14,113	—	8.10	3/10/2024
	(2)	2,666	—	6.15	3/1/2025
	(2)	9,580	—	6.45	6/4/2025
	(2)	25,000	—	7.00	9/30/2025
	(2)	10,000	—	4.36	3/11/2026

(1) Except as otherwise noted, the shares subject to the options shall vest and become exercisable as to 1/4th of the shares subject to the option on the first anniversary of the vesting commencement date, and thereafter as to 1/48th of the shares subject to such option on each monthly anniversary of the vesting commencement date, such that all shares subject to the option will be vested on the fourth anniversary of the vesting commencement date, subject to the holder continuing to provide services to Mirna through such vesting date.
(2) The options are fully vested.
(3) The shares subject to the option vest and become exercisable as to 1/48th of the shares subject to such option on each monthly anniversary of the vesting commencement date, such that all shares subject to the option will be vested on the fourth anniversary of the vesting commencement date, subject to the holder continuing to provide services to Mirna through such vesting date.

Dr. Barbosa had no outstanding equity awards at December 31, 2016.

Narrative to 2016 Summary Compensation Table and Outstanding Equity Awards at 2016 Calendar Year End

Terms and Conditions of Employment Arrangements with Mirna's NEOs

Mirna has entered into agreements with each of its NEOs in connection with his commencement of employment with Mirna and, in respect of Drs. O'Neill and Barbosa and Mr. Irvin, in connection with his termination of employment. These agreements set forth the terms and conditions of employment of each NEO, including base salary, initial stock option grants, and standard employee benefit plan participation. The Mirna Board of Directors or the compensation committee reviews each NEO's base salary from time to time to ensure compensation adequately reflects the NEO's qualifications, experience, role and responsibilities. Each of the NEOs is also subject to certain confidentiality, non-competition, non-solicitation and arbitration restrictive covenants. For calendar year 2016, Dr. Lammers' annual base salary was $415,100, Mr. Fuhrman's annual base salary was $334,800, Dr. O'Neill's base salary was $340,000, Dr. Barbosa's base salary was $360,500 and Mr. Irvin's base salary was $243,000.

Pursuant to Mr. Fuhrman's employment agreement, Mirna reimbursed Mr. Fuhrman for $33,000 in temporary housing expenses during 2016.

Pursuant to Dr. O'Neill's employment agreement, Mirna reimbursed Dr. O'Neill for $28,271 in relocation expenses, including travel, moving and reimbursement of mortgage interest expenses for his prior residence.

Pursuant to Dr. Barbosa's employment agreement, Mirna reimbursed Dr. Barbosa for his travel and temporary housing expenses (which amounted to a total of $16,894 in calendar year 2016).

Mirna has entered into a Change in Control Severance Agreement with each of its NEOs that provides for severance payments and benefits upon certain qualifying terminations of employment. Pursuant to the terms of the Change in Control Severance Agreements, in the event an NEO's employment is terminated by Mirna other than for "cause" or the executive experiences a "constructive termination" (each as defined above), then the NEO will receive as severance nine months (or 12 months in the case of Dr. Lammers) of base salary in a single cash lump sum payment and up to nine months (or 12 months in the case of Dr. Lammers) of healthcare continuation coverage premium reimbursement; provided, that if the termination or resignation occurs within the period commencing on a "change in control" (as defined below) and ending 12 months after a change in control, the severance will consist of 12 months (or 18 months in the case of Dr. Lammers) of base salary paid in a single cash lump sum, 100% (or 150% in the case of Dr. Lammers) of the executive's target bonus paid in a single cash lump sum, up to 12 months (or 18 months in the case of Dr. Lammers) of healthcare continuation coverage premium reimbursement and full vesting acceleration for each stock option and other equity award held by the NEO. The NEO must timely deliver an effective release of claims to Mirna in order to be eligible for the foregoing severance benefits.

Dr. O'Neill received severance benefits in connection with his resignation from Mirna pursuant to a separation agreement detailed under the section below entitled "*—Terms and Conditions of Vincent O'Neill's Separation Agreement.*"

Dr. Barbosa received severance benefits in connection with his resignation from Mirna pursuant to a separation and release agreement detailed under the section below entitled "*—Terms and Conditions of Miguel Barbosa's Separation and Release Agreement.*"

Mr. Irvin received severance benefits in connection with his resignation from Mirna pursuant to a Separation Agreement detailed under the section below entitled "*—Terms and Conditions of Jon Irvin's Separation Agreement.*"

For purposes of the Change in Control Severance Agreements, "change in control" generally means (i) the transfer or exchange in a single transaction or series of related transactions by Mirna Stockholders of more than 50% of Mirna's voting stock to a person or group; (ii) a change in the composition of the Mirna Board of Directors over a two-year period such that 50% or more of the members of the Mirna Board of Directors were elected through one or more contested elections; (iii) a merger, consolidation, reorganization or business combination in which Mirna is involved, directly or indirectly, other than a merger, consolidation, reorganization or business combination which results in outstanding Mirna voting securities immediately before the transaction continuing to represent a majority of the voting power of the acquiring company's outstanding voting securities and after which no person or group beneficially owns 50% or more of the outstanding voting securities of the surviving entity immediately after the transaction; or (iv) the sale, exchange, or transfer of all or substantially all of Mirna's assets.

Terms and Conditions of Annual Bonuses

For 2016, all of the Mirna NEOs were eligible for cash performance-based bonuses pursuant to the achievement of certain performance objectives. The performance targets are approved annually by the Mirna Board of Directors. When determining the 2016 performance bonus program for the NEOs, the Mirna Board of Directors set certain performance goals, using a mixture of performance objectives after receiving recommendations from the compensation committee and input from Mirna's Chief Executive Officer. These performance objectives included certain financial, organizational, clinical, intellectual property and development measures. After determining performance targets, each performance target is given a different weight when determining the overall bonus amount based on the importance to the success of Mirna for each performance target. For calendar year 2016, the financial performance targets were weighted at 45%, the organizational and clinical targets were each weighted at 20% and the intellectual property and development targets were each weighted at 7.5%. For each of these performance targets under the annual bonus program, the Mirna Board of Directors set general performance goals, but there was no minimum or maximum achievement for each performance target; instead, the Mirna Board of Directors weighed the achievement, partial achievement or non-achievement for each performance target when deciding the overall achievement level. These performance goals were not expected to be attained based on average or below-average performance. The Mirna Board of Directors intended for the performance targets to require significant effort on the part of the NEOs and, therefore, set these targets at levels they believed would be difficult to achieve, such that average or below-average performance would not satisfy these targets.

Each NEO's target bonus opportunity is expressed as a percentage of base salary, which can be achieved by meeting the corporate performance goals. For each of the NEOs, the compensation committee (or, for Dr. Lammers, the Mirna Board of Directors) originally set these target percentages and review them annually to ensure they are adequate, and, while reviewing these target percentages the compensation committee (or, for Dr. Lammers, the Mirna Board of Directors) does not follow a formula but rather uses the factors as general background information prior to determining the target bonus opportunity rates for the participating NEOs. The compensation committee (or, for Dr. Lammers, the Mirna Board of Directors) sets these rates based on each

participating executive's experience in his or her role with Mirna and the level of responsibility held by each executive, which the Mirna Board of Directors believes directly correlates to his or her ability to influence corporate results. For 2016, the Mirna Board of Directors used a guideline target bonus opportunity of 50% for Dr. Lammers, 35% for Dr. Barbosa, Mr. Fuhrman, and Dr. O'Neill and 30% for Mr. Irvin.

Corporate goals and performance targets are reviewed and approved by the compensation committee (or, for Dr. Lammers, the Mirna Board of Directors) prior to any allocation of the annual bonuses. In early 2017, the compensation committee (or, for Dr. Lammers, the Mirna Board of Directors) reviewed Mirna's 2016 company-wide performance with respect to determining bonuses for executive officers and determined not to award 2016 cash bonuses to the NEOs.

Terms and Conditions of Equity Award Grants

Each of Dr. Lammers, Mr. Fuhrman, Dr. O'Neill, and Mr. Irvin received an option to purchase Mirna Common Stock in calendar year 2016. The table above entitled "*Outstanding Equity Awards at 2016 Calendar Year End*" describes the material terms of other option awards made in past calendar years to Mirna's NEOs.

On March 11, 2016, Mirna granted Dr. Lammers an option to purchase 165,000 shares of Mirna Common Stock having an exercise price per share equal to $4.36. The option vests and becomes exercisable as to 1/48th of the shares subject to such option on each monthly anniversary of the grant date, such that all shares subject to the option will be vested on the fourth anniversary of the vesting commencement date, subject to Dr. Lammers continuing to provide services to Mirna through such vesting date

On March 11, 2016, Mirna granted Mr. Fuhrman an option to purchase 60,000 shares of Mirna Common Stock having an exercise price per share equal to $4.36. The option vests and becomes exercisable as to 25% of the shares subject to the option on March 11, 2017, and as to 1/48th of the shares subject to the option on each monthly anniversary thereafter, subject to Mr. Fuhrman continuing to provide services to Mirna through such vesting date.

On March 11, 2016, Mirna granted Mr. Irvin an option to purchase 10,000 shares of Mirna Common Stock having an exercise price per share equal to $4.36. The option vests and becomes exercisable as to 1/48th of the shares subject to such option on each monthly anniversary of the grant date, such that all shares subject to the option will be vested on the fourth anniversary of the vesting commencement date, subject to Mr. Irvin continuing to provide services to Mirna through such vesting date.

On April 25, 2016, Mirna granted Dr. O'Neill an option to purchase 250,000 shares of Mirna Common Stock having an exercise price per share equal to $4.42. The option vests and becomes exercisable as to 25% of the shares subject to the option on April 25, 2017 and as to 1/48th of the shares subject to the option on each monthly anniversary thereafter, subject to Dr. O'Neill continuing to provide services to Mirna through such vesting date.

Terms and Conditions of 401(k) Plan

Mirna's U.S. eligible employees, including its NEOs, participate in Mirna's 401(k) plan. Enrollment in the 401(k) plan is automatic for employees who meet eligibility requirements unless they decline participation. The 401(k) plan is intended to qualify under Section 401(k) of the Code so that contributions to the 401(k) plan by employees or by Mirna, and the investment earnings thereon, are not taxable to the employees until withdrawn from the 401(k) plan, and so that contributions by Mirna, if any, will be deductible by Mirna when made. Under the 401(k) plan, employees may elect to reduce their current compensation by up to the statutorily prescribed annual limit and to have the amount of such reduction contributed to the 401(k) plan. Under the 401(k), for calendar year 2016, Mirna provides matching contributions of $0.50 per dollar up to 8% of an employee's compensation.

Terms and Conditions of Vincent O'Neill's Separation Agreement

Dr. O'Neill resigned his employment effective May 19, 2017 and entered into a Separation Agreement (the "O'Neill Separation Agreement") with Mirna effective as of May 26, 2017. The O'Neill Separation Agreement superseded all other prior agreements between Dr. O'Neill and Mirna. Pursuant to the O'Neill Separation Agreement, Mirna shall pay Dr. O'Neill an aggregate separation payment of $459,000 (less applicable withholdings and taxes), which represents 12 months of his base salary and one times his target annual bonus assuming achievement of his performance goals at target, in exchange for a general release of all claims against Mirna. Dr. O'Neill will also receive the payment of continued health, dental and vision insurance premiums for himself for up to 12 months and 100% vesting acceleration on his outstanding equity awards. The O'Neill Separation Agreement also included a general release of all claims against Mirna.

Terms and Conditions of Miguel Barbosa's Separation Agreement

Dr. Barbosa resigned his employment effective June 29, 2016 and entered into a Separation Agreement (the "Barbosa Separation Agreement") with Mirna on June 29, 2016. The Barbosa Separation Agreement superseded all other prior agreements between Dr. Barbosa and Mirna. In 2016, pursuant to the Barbosa Separation Agreement, Mirna paid Dr. Barbosa an aggregate separation payment of $270,375 (less applicable withholdings and taxes), which, consistent with the severance benefits provided under Dr. Barbosa's Change in Control and Severance Agreement for termination not in connection with a change in control, represented nine months of his base salary, in exchange for a general release of all claims against Mirna. Dr. Barbosa also received the payment of continued health, dental and vision insurance premiums for himself for up to nine months. The Barbosa Separation Agreement also included a general release of all claims against Mirna.

Terms and Conditions of Jon Irvin's Separation Agreement

Mr. Irvin resigned his employment effective December 2, 2016 and entered into a separation agreement (the "Irvin Separation Agreement") with Mirna on December 2, 2016. The Irvin Separation Agreement superseded all other prior agreements between Mr. Irvin and Mirna and provided for Mr. Irvin to receive, as severance $315,900 (less applicable withholdings and taxes), which constituted 12 months of his base salary and 100% of his target bonus opportunity. The Irvin Separation Agreement also provided for the full acceleration of vesting for all options held by Mr. Irvin on his termination date as well as the payment of continued health, dental and vision insurance premiums for himself for up to 12 months. The Irvin Separation Agreement also included a general release of all claims against Mirna.

SYNLOGIC EXECUTIVE COMPENSATION

Certain of Synlogic's executive officers for the year ended December 31, 2016 who will serve as executive officers of the combined organization following the consummation of the Merger are referred to in this proxy statement/prospectus/information statement as "Synlogic's named executive officers." Synlogic's named executive officers and their current positions are as follows:

- Jose Carlos Gutierrez-Ramos, Ph.D., President and Chief Executive Officer;
- Paul Miller, Ph.D., Chief Scientific Officer; and
- Aoife M. Brennan, MB, BCh, BAO, MMSc, Chief Medical Officer.

For information regarding all of the executive officers of the combined organization after the consummation of the Merger, please see the section entitled "*Management Following the Merger—Executive Officers and Directors—Executive Officers and Directors of the Combined Organization Following the Merger*" in this proxy statement/prospectus/information statement.

Summary Compensation Table

The following table presents information regarding the total compensation awarded to, earned by, and paid to Synlogic's named executive officers for services rendered to Synlogic in all capacities for the years indicated.

	Year	Salary ($)	Bonus(1) ($)	Stock Awards (2) ($)	Option Awards ($)	Non-Equity Incentive Plan Compensation (3) ($)	All Other Compensation (4) ($)	Total ($)
Jose Carlos Gutierrez-Ramos, Ph.D.(5)	2016	412,000	—	—	—	116,802	—	528,802
President and Chief Executive Officer	2015	254,546	—	537,440	—	72,000	—	863,986
Paul Miller, Ph.D.	2016	309,000	—	65,237	—	62,573	—	436,810
Chief Scientific Officer	2015	300,000	—	33,984	—	—	—	333,984
Aoife M. Brennan, MB, BCh, BAO, MMSc(6)	2016	115,000	85,000	100,935	—	31,395	53,492	385,822
Chief Medical Officer	2015	—	—	—	—	—	—	—

(1) The amount reported represents a forfeitable signing bonus received by Dr. Brennan in connection with her commencement of employment.
(2) The amounts reported represent the aggregate grant date fair value of stock awards granted as estimated pursuant to FASB ASC 718, *Compensation—Share based compensation* (ASC 718). See Note 10 to Synlogic's accompanying audited financial statements included in this proxy statement/prospectus/information statement for the assumptions used in calculating these amounts.
(3) The amounts reported represent bonuses based upon the discretion of the Synlogic Board of Directors and as outlined in each individual employment agreement for the years ended December 31, 2016 and 2015, as indicated, and were paid in the subsequent year.
(4) The amount reported represents the tax gross up payment made to Dr. Brennan in connection with the payment of her signing bonus.
(5) Dr. Gutierrez-Ramos commenced employment with Synlogic in May 2015 and salary and non-equity incentive plan compensation payments were prorated for this initial year of employment.
(6) Dr. Brennan commenced employment with Synlogic in September 2016 and salary and non-equity incentive plan compensation payments were prorated for this initial year of employment.

Narrative Disclosure to Summary Compensation Table

Historically, Synlogic's executive compensation program has reflected Synlogic's innovative and growth-oriented corporate culture and is designed to attract, retain and incentivize and align executives with both short- and long-term company objectives. To date, the compensation of Synlogic's Chief Executive Officer and

Synlogic's other executive officers has consisted of a combination of base salary, cash bonuses and long-term incentive compensation paid in the form of equity. Synlogic's named executive officers, like all full-time employees, are eligible to participate in Synlogic's health and welfare benefit plans. As Synlogic transitions from a private company to a publicly traded company, it will evaluate its compensation values and philosophy and compensation plans and arrangements as circumstances require. Synlogic expects, following the consummation of the Merger, the combined organization will review executive compensation from time to time at the discretion of the compensation committee of the combined organization's board of directors. As part of this review process, Synlogic expects the board of directors and compensation committee of the combined organization to apply the values and philosophy of the combined organization, while considering the compensation levels needed to ensure the combined organization's executive compensation program remains competitive and aligns incentives with the goals of the combined organization.

Base Salary

In 2016, Synlogic's compensation committee and the Synlogic Board of Directors approved an annual increase in base salaries for all employees, including Synlogic's executive officers, of 3%, resulting in an annual base salary of $412,000 for Dr. Gutierrez-Ramos and $309,000 for Dr. Miller. In March 2017, Synlogic's compensation committee and the Synlogic Board of Directors approved base salary increases for Synlogic's management team, resulting in an annual base salary of $424,360 for Dr. Gutierrez-Ramos, $349,036 for Dr. Brennan and $316,725 for Dr. Miller. In May 2017, the Synlogic Board of Directors approved an additional increase in annual base salary for Dr. Gutierrez-Ramos to $450,000.

Annual Bonuses

Synlogic's employment agreements with its executive officers provide for the opportunity to earn a cash bonus based upon achievement of both corporate and individual goals determined by the Synlogic Board of Directors or compensation committee in its discretion based on a target percentage of annual base salary. In March 2017, Synlogic's compensation committee awarded Dr. Gutierrez-Ramos a cash bonus of $116,802, which represented 28.4% of his annual base salary, in recognition of his services provided in the year ended December 31, 2016 and in accordance with the terms of his employment agreement and bonus assessment. In March 2017, Synlogic's compensation committee awarded Dr. Miller a cash bonus of $62,573, which represented 20.3% of his annual base salary in recognition of his services provided in the year ended December 31, 2016 and in accordance with the terms of his employment agreement and bonus assessment. In March 2017, Synlogic's compensation committee awarded Dr. Brennan a cash bonus of $31,395, which represented 27.3% of her annual base salary, prorated for the number of months in the year she was employed by Synlogic, in recognition of her services provided in the year ended December 31, 2016 and in accordance with the terms of her employment agreement and bonus assessment. In addition, Dr. Brennan also received a signing bonus of $85,000 plus a gross up for taxes to be paid on such compensation in connection with her commencement of employment with Synlogic. With respect to her signing bonus, Dr. Brennan will be required to reimburse Synlogic if she voluntarily resigns within 12 months following the commencement of her employment or is terminated by Synlogic for cause. In March 2016, Synlogic's compensation committee awarded Dr. Gutierrez-Ramos a cash bonus of $72,000, prorated for the number of months in the year he was employed by Synlogic, which represented 28.3% of his annual base salary, in recognition of his services provided in the year ended December 31, 2015 and in accordance with the terms of his employment agreement and bonus assessment. In March 2016, Synlogic's compensation committee awarded Dr. Miller a cash bonus of $67,500, which represented 22.5% of his annual base salary, in recognition of his services provided in the year ended December 31, 2015 and in accordance with the terms of his employment agreement and bonus assessment.

Stock Awards

In connection with the commencement of his employment in 2015, Dr. Gutierrez-Ramos was granted 655,494 common units in Synlogic, LLC, which were subject to time-based vesting over four years with 25% of

the common units vesting on the first anniversary of Dr. Gutierrez-Ramos's commencement of employment and the remainder vesting one-forty-eighth (1/48th) per month thereafter.

In connection with the commencement of his employment in 2015, Dr. Miller was granted 80,360 incentive units, in Synlogic, LLC, which were subject to time-based vesting over four years with 25% of the incentive units vesting on the first anniversary of Dr. Miller's commencement of employment and the remainder vesting one-forty-eighth (1/48th) per month thereafter. In 2016, the Synlogic Board of Directors granted Dr. Miller 110,036 incentive units in Synlogic, LLC, which were subject to time-based vesting over four years with one-forty-eighth (1/48th) of the incentive units vesting per month on each monthly anniversary of the date of grant. The incentive units were intended to qualify as a "profits interest" for U.S. federal income tax purposes and would only have value to the extent the equity value of Synlogic, LLC increased beyond the value at issuance.

In connection with the commencement of her employment in 2016, Dr. Brennan was granted 170,247 incentive units in Synlogic, LLC, which were subject to time-based vesting over four years with 25% of the incentive units vesting on the first anniversary of her commencement of employment and the remainder vesting one-forty-eighth (1/48th) per month thereafter. The incentive units were intended to qualify as a "profits interest" for U.S. federal income tax purposes and would only have value to the extent the equity value of Synlogic, LLC increased beyond the value at issuance.

As described in the section of this proxy statement/prospectus/information statement entitled *"Synlogic Reorganization,"* Synlogic, LLC completed a corporate reorganization from an LLC to a corporation on May 15, 2017. As part of the Reorganization, equity incentive awards granted by Synlogic, LLC were converted into equity incentive awards for shares of Synlogic Common Stock. Common units of Synlogic, LLC were converted one for one into shares of Synlogic Common Stock and incentive units of Synlogic, LLC were converted into a number of shares of Synlogic Common Stock equal to (x) the value of the appreciation of such incentive units between the date of grant and immediately prior to the Reorganization divided by (y) the value of a share of Synlogic Common Stock on the date of such Reorganization. To the extent that such shares of Synlogic Common Stock are unvested, they remain Synlogic Restricted Stock. All shares of Synlogic Restricted Stock were issued under the Synlogic 2017 Stock Incentive Plan and continue to vest on the same schedule as the original equity awards. In the event a named executive officer terminates employment for any reason, any shares of Synlogic Restricted Stock are automatically forfeited.

In addition, in 2017, the Synlogic Board of Directors granted the following additional Synlogic Options to its named executive officers: Dr. Gutierrez-Ramos was granted an option to purchase 300,000 shares of Synlogic Common Stock at an exercise price of $7.48 per share, which option is subject to vesting at a rate of one-forty-eighth (1/48th) of the total number of shares subject thereto per month over four years; Dr. Miller was granted an option to purchase 5,023 shares of Synlogic Common Stock at an exercise price of $7.48 per share, which was 66.67% vested on the date of the completion of the Reorganization and the balance of which will vest monthly through September 15, 2018 and an option to purchase 49,554 shares of Synlogic Common Stock at an exercise price of $7.48 per share, which was 20.83% vested on the date of the completion of the Reorganization and the balance of which will vest monthly through July 6, 2020; and Dr. Brennan was granted an option to purchase 75,000 shares of Synlogic Common Stock at an exercise price of $7.48 per share, which option is subject to vesting at a rate of one forty-eighth (1/48th) of the total number of shares subject thereto per month over four years and an option to purchase 76,669 shares of Synlogic Common Stock at an exercise price of $7.48 per share, of which 25% will vest on the first anniversary of Dr. Brennan's commencement of employment and the remainder monthly thereafter through September 1, 2020.

Outstanding Equity Awards at Fiscal Year End

The following table presents the outstanding equity awards held by each of Synlogic's named executive officers as of December 31, 2016. All equity awards set forth in the table below were granted under the Synlogic, LLC 2015 Stock Plan.

	Stock Awards	
	Number of shares or units of stock that have not vested	Market value of shares or units of stock that have not vested(5) ($)
Jose Carlos Gutierrez-Ramos, Ph.D.	396,029(1)	796,018
Paul Miller, Ph. D.	35,158(2)	—
	98,574(3)	—
Aoife M. Brennan, MMB, BCh, BAO, MMSc	170,247(4)	—

(1) Unvested common units vest 1/48th each month through May 14, 2019.
(2) Unvested incentive units vest 1/48th each month through September 15, 2018. Such incentive units have a threshold price of $2.53 per unit and a catch up provision to be paid after all preferences have been paid to other unit holders of the difference per unit between $0.49 and $2.53 per unit.
(3) Unvested incentive units vest 1/48th each month through July 6, 2020. Such incentive units have a threshold price of $3.53 per unit.
(4) Unvested incentive units vest 25% on the first anniversary of the vesting commencement date (September 1, 2017) and 1/48th each month thereafter through September 1, 2020. Such incentive units have a threshold price of $3.53 per unit.
(5) The fair market value of the common units as of December 31, 2016 was $2.01 per unit. The incentive units only have value when the fair market value of Synlogic, LLC's common units exceeds the threshold price for such incentive unit.

As discussed above and in the section of this proxy statement/prospectus/information statement entitled "*Synlogic Reorganization,*" Synlogic, LLC completed a corporate reorganization from a LLC to a corporation on May 15, 2017. As part of the Reorganization, holders of Synlogic, LLC's outstanding common units received one share of Synlogic Common Stock for each common unit held immediately prior to the Reorganization, and holders of Synlogic, LLC's outstanding incentive units received Synlogic Common Stock subject to restricted stock agreements in an amount equal in value to the appreciation of such incentive units between the date of grant and immediately prior to the Reorganization. Upon completion of the Merger, the shares of Synlogic Common Stock will convert into shares to purchase Mirna Common Stock, with the number of shares being appropriately adjusted to reflect the Exchange Ratio. See the section entitled "*The Merger Agreement—Treatment of Synlogic Options*" in this proxy statement/prospectus/information statement.

Employment Agreements and Potential Payments Upon Termination of Employment or Change in Control

Synlogic has entered into employment agreements with each of Synlogic's named executive officers as described below, as well as standard confidential information and/or inventions assignment agreements under which each of Synlogic's named executive officers has agreed not to disclose Synlogic's confidential information. These employment agreements provide for "at will" employment.

Jose Carlos Gutierrez-Ramos, Ph.D.

Synlogic entered into an employment agreement with Dr. Gutierrez-Ramos in 2015 that initially provided for a base salary of $400,000, subject to review and adjustment. Dr. Gutierrez-Ramos's base salary was increased to $412,000 for 2016 and $424,360 for 2017. The agreement also provides that Dr. Gutierrez-Ramos is eligible to earn an annual cash incentive bonus of up to 30% of his base salary based on the achievement of corporate and/or individual performance goals, as determined by the Synlogic Board of Directors. Dr. Gutierrez-Ramos is also

eligible to participate in the employee benefit plans available to Synlogic's employees, subject to the terms of those plans. In May 2017, Dr. Gutierrez-Ramos's employment agreement was amended to increase his annual base salary to $450,000 and his bonus target to 40% of his annual base salary.

Dr. Gutierrez-Ramos's employment agreement also provides that, in the event that his employment is terminated by Synlogic for any reason other than for "cause," death or "disability," or by Dr. Gutierrez-Ramos for "good reason" (each as defined in his employment agreement), subject to the execution and effectiveness of a separation agreement and release, he will be entitled to receive (i) continuing severance pay at a rate equal to 100% of his base salary, as then in effect (less applicable withholding), for a period of 12 months from the date of such termination, to be paid periodically in accordance with Synlogic's normal payroll practices; (ii) the right to continued health care benefits under COBRA, paid by Synlogic at a cost similar for active and similarly situated employees who receive the same type of coverage until the earlier of (a) 12 months after termination, or (b) the date on which Dr. Gutierrez-Ramos becomes eligible for healthcare insurance with a subsequent employer, and (iii) a lump-sum payment equal to the prorated portion of the target bonus for the fiscal year in which Dr. Gutierrez-Ramos is terminated.

Dr. Gutierrez-Ramos's employment agreement provides that, in the event Dr. Gutierrez-Ramos's employment is terminated on account of death, "disability," resignation for "good reason" or without "cause," in any case, within the 12-month period immediately following or the 30 day period immediately prior to a change in control, then Dr. Gutierrez-Ramos's outstanding unvested Synlogic Restricted Stock and/or Synlogic Options shall become fully vested.

In addition, Dr. Gutierrez-Ramos has entered into a non-solicitation and non-competition agreement that applies during the term of Dr. Gutierrez-Ramos's employment and for 12 months thereafter.

Paul Miller, Ph.D.

Synlogic entered into an employment agreement with Dr. Miller in 2014 that initially provided for a base salary of $300,000, subject to review and adjustment. Dr. Miller's base salary was increased to $309,000 for 2016 and to $316,725 for 2017. The agreement also provides that Dr. Miller is eligible to earn an annual cash incentive bonus of up to 25% of his base salary based on the achievement of corporate and/or individual performance goals, as determined by the Synlogic Board of Directors. Dr. Miller is also eligible to participate in the employee benefit plans available to Synlogic's employees, subject to the terms of those plans.

Dr. Miller's employment agreement provides that, in the event that his employment is terminated by Synlogic for any reason other than for "cause," death or "disability," or by Dr. Miller for "good reason" (each as defined in his employment agreement), subject to the execution and effectiveness of a separation agreement and release, he will be entitled to receive continuing severance pay at a rate equal to 100% of his base salary, as then in effect (less applicable withholding), for a period of up to the earlier of (a) six months from the date of such termination or (b) the date he becomes employed full time.

Effective May 2017, Dr. Miller's employment agreement was amended to increase his bonus target to 30% of his annual base salary and align his employment agreement with Synlogic's other executive officers by providing him with six month's severance whether or not he becomes employed by another company; a lump-sum payment equal to the prorated portion of the target bonus for the fiscal year in which he is terminated; a right to health care benefits under COBRA to be paid by Synlogic until the earlier of (a) six months from termination, or (b) the date on which Dr. Miller becomes eligible for healthcare insurance with a subsequent employer; and accelerated vesting of his equity in the event his employment is terminated on account of death, "disability," resignation for "good reason" or without "cause," in any case, within the 12-month period immediately following or the 30-day period immediately prior to a "change in control."

In addition, Dr. Miller has entered into a non-solicitation and non-competition agreement that applies during the term of Dr. Miller's employment and for 12 months thereafter.

Aoife M. Brennan, MB, BCh, BAO, MMSc

Synlogic entered into an employment agreement with Dr. Brennan in September 2016 that initially provided for a base salary of $345,000, subject to review and adjustment. The agreement also provides that she is eligible to earn an annual cash incentive bonus of up to 27.5% of her base salary based on the achievement of corporate and/or individual performance goals, as determined by the Synlogic Board of Directors. Dr. Brennan is also eligible to participate in the employee benefit plans available to Synlogic's employees, subject to the terms of those plans. In addition, Dr. Brennan's employment agreement also provided her with a signing bonus of $85,000, plus a gross up for taxes to be paid on such compensation in connection with her commencement of employment with Synlogic and that she will be required to reimburse Synlogic those amounts if she voluntary resigns within 12 months following the commencement of her employment or is terminated by Synlogic for cause. In May 2017, Dr. Brennan's employment agreement was amended to increase her annual base salary to $349,036 and her bonus target to 30% of her annual base salary.

Dr. Brennan's employment agreement provides that, in the event that Dr. Brennan's employment is terminated by Synlogic for any reason other than for "cause," death or "disability," or by Dr. Brennan for "good reason" (each as defined in her employment agreement), subject to the execution and effectiveness of a separation agreement and release, she will be entitled to receive (i) continuing severance pay at a rate equal to 100% of her base salary, as then in effect (less applicable withholding), for a period of six months from the date of such termination, to be paid periodically in accordance with Synlogic's normal payroll practices; (ii) the right to continue health care benefits under COBRA, paid by Synlogic at a cost similar for active and similarly situated employees who receive the same type of coverage until the earlier of (a) six months from termination, or (b) the date on which Dr. Brennan becomes eligible for healthcare insurance with a subsequent employer, and (iii) a lump-sum payment equal to the prorated portion of the target bonus for the fiscal year in which Dr. Brennan is terminated.

Dr. Brennan's employment agreement provides that, in the event Dr. Brennan's employment is terminated on account of death, "disability," resignation for "good reason" or without "cause," in any case, within the 12-month period immediately following or the 30-day period immediately prior to a "change in control," then Dr. Brennan's outstanding unvested Synlogic Restricted Stock and/or Synlogic Options shall become fully vested.

In addition, Dr. Brennan has entered into a non-solicitation and non-competition agreement that applies during the term of Dr. Brennan's employment and for 12 months thereafter.

The following definitions apply to Dr. Gutierrez-Ramos's, Dr. Miller's and Dr. Brennan's employment agreements:

"Cause" is defined as the executive's (i) conviction of a felony, plea of guilty or "no contest" to a felony, or confession of guilt to a felony; (ii) act or omission which constitutes willful misconduct or negligence that results in loss, damage or injury to Synlogic or its prospects, including, but not limited to (A) disloyalty, dishonesty or a breach of fiduciary duty to Synlogic or Synlogic Stockholders, (B) theft, fraud, embezzlement or other illegal conduct, or (C) deliberate disregard of a rule or policy of Synlogic; (iii) failure, refusal or unwillingness to perform, to the reasonable satisfaction of the Synlogic Board of Directors determined in good faith, any duty or responsibility assigned to the executive, which failure of performance continues for a period of more than two weeks after written notice thereof has been provided by the Synlogic Board of Directors, setting forth in reasonable detail the nature of such failure of performance; or (iv) the material breach by the executive of any of the provisions of the employment agreement or its related agreements.

"Good reason" is defined as a resignation that occurs within 30 days following: (i) a change in the principal location at which the executive provides services to Synlogic beyond 50 miles from Cambridge, Massachusetts; (ii) a reduction in the executive's compensation or a material reduction in the executive's benefits, except such a reduction in connection with a general reduction in compensation or other benefits of all senior executives of

Synlogic; (iii) a material breach of the executive's employment agreement by Synlogic that has not been cured within 10 days after written notice thereof by the executive to Synlogic; or (iv) a failure by Synlogic to obtain the assumption of the employment agreement by any successor to Synlogic.

"Disability" is defined as the executive's inability, due to physical or mental illness or disease, to perform the functions then performed by the executive for 180 consecutive days, accompanied by the likelihood, in the opinion of a physician chosen by Synlogic and reasonably acceptable to the executive, that the executive will be unable to perform such functions within the reasonably foreseeable future.

"Change in control" is defined as (i) the sale of Synlogic by merger in which the Synlogic Stockholders in their capacity as such no longer own a majority of the outstanding equity securities of Synlogic (or its successor); (ii) any sale of all or substantially all of the assets or capital stock of Synlogic (other than in a spin-off or similar transaction) or (iii) any other acquisition of the business of Synlogic, as determined by the Synlogic Board of directors in its sole discretion. For the avoidance of doubt, in no event shall a bona fide equity or debt financing of Synlogic, including a financing in which greater than 50% of Synlogic's outstanding equity securities are acquired by a third-party, or a reorganization required to effect an initial public offering, be deemed a "change in control." The Merger will not constitute a change in control of Synlogic.

Other Benefits

Executive officers of Synlogic are eligible to participate in all of Synlogic's employee benefit plans, including life insurance, medical, dental and vision, a 401(k) retirement plan and a flex spending account plan. Synlogic also provides paid-time-off benefits to all similarly-situated employees.

Synlogic, LLC's 2015 Equity Incentive Plan

Synlogic, LLC's 2015 Equity Incentive Plan (the "Synlogic, LLC 2015 Plan") was approved by the board of directors of Synlogic, LLC and its equity holders in 2015 and was adopted on October 30, 2015. The Synlogic, LLC 2015 Plan permitted the granting of incentive units as defined in the Synlogic, LLC Operating Agreement to employees, executive officers, directors and consultants. The administrator determined upon grant whether such incentive units were intended to be treated as "profits interests" within the meaning of Revenue Procedure 93-27 as clarified by Revenue Procedure 2001-43 for federal income tax purposes (or pursuant to any subsequent authority).

The board of directors of Synlogic, LLC acted as administrator of the Synlogic, LLC 2015 Plan. The administrator had full power to select, from among the individuals eligible for awards, the individuals to whom awards were to be granted, and to determine the specific terms and conditions of each award, subject to the provisions of the Synlogic, LLC 2015 Plan.

The Synlogic, LLC 2015 Plan and all grants made thereunder were cancelled upon the consummation of the Reorganization and were replaced with shares of Synlogic Common Stock under the 2017 Plan with continued vesting on the same terms as the incentive units issued under the Synlogic, LLC 2015 Plan.

Synlogic 2017 Equity Incentive Plan

Synlogic adopted the Synlogic, Inc. 2017 Stock Incentive Plan (the "2017 Plan") on May 11, 2017. The 2017 Plan will expire in 2027. Under the 2017 Plan, Synlogic may grant incentive stock options, non-qualified stock options, restricted and unrestricted stock awards and other stock-based awards. There are 3,214,926 shares of Synlogic Common Stock authorized for issuance under the 2017 Plan.

The Synlogic Board of Directors is authorized to administer the 2017 Plan. In accordance with the provisions of the 2017 Plan, the Synlogic Board of Directors determines the terms of Synlogic Options and other awards issued pursuant thereto, including the following:

- which employees, directors and consultants shall be granted awards;

- the number of shares of Synlogic Common Stock subject to Synlogic Options and other awards;
- the exercise price of each Synlogic Option, which generally shall not be less than fair market value of the Synlogic Common Stock on the date of grant;
- the termination or cancellation provisions applicable to Synlogic Options;
- the terms and conditions of other awards, including conditions for repurchase, termination or cancellation, issue price and repurchase price; and
- all other terms and conditions upon which each award may be granted in accordance with the 2017 Plan.

In addition, the Synlogic Board of Directors or any committee to which the Synlogic Board of Directors delegates authority may, with the consent of the affected plan participants, re-price or otherwise amend outstanding awards consistent with the terms of the 2017 Plan.

Upon a merger, consolidation or sale of all or substantially all of Synlogic's assets, the Synlogic Board of Directors or any committee to which the Synlogic Board of Directors delegates authority, or the board of directors of any corporation assuming Synlogic's obligations, may, in its sole discretion, take any one or more of the following actions pursuant to the 2017 Plan, as to some or all outstanding awards, to the extent not otherwise agreed under any individual agreement:

- provide that outstanding Synlogic Options will be assumed or substituted for options of the successor corporation;
- provide that the outstanding Synlogic Options must be exercised within a certain number of days, either to the extent the Synlogic Options are then exercisable, or at the Synlogic Board of Directors's discretion, any such Synlogic Options being made partially or fully exercisable;
- terminate outstanding Synlogic Options in exchange for a cash payment of an amount equal to the difference between (a) the consideration payable upon consummation of the corporate transaction to a holder of the number of shares into which such Synlogic Option would have been exercisable to the extent then exercisable, or in the Synlogic Board of Directors' discretion, any such Synlogic Options being made partially or fully exercisable, and (b) the aggregate exercise price of those Synlogic Options;
- provide that outstanding stock grants will be substituted for shares of the successor corporation or consideration payable with respect to Synlogic's outstanding stock in connection with the corporate transaction; and
- terminate outstanding stock grants in exchange for payment of an amount equal to the consideration payable upon consummation of the corporate transaction to a holder of the same number of shares comprising the stock grant, to the extent the stock grant is no longer subject to any forfeiture or repurchase rights, or at the Synlogic Board of Directors's discretion, all forfeiture and repurchase rights being waived upon the corporate transaction. For purposes of determining such payments, in the case of a corporate transaction the consideration for which, in whole or in part, is other than cash, the consideration other than cash shall be valued at the fair market value thereof as determined in good faith by the Synlogic Board of Directors.

SYNLOGIC DIRECTOR COMPENSATION

	Fees earned or paid in cash ($)	Stock Awards(1) ($)
Peter Barrett Ph.D.	—	—
Chau Khuong	—	—
Nick Leschly	—	13,242
Edward Mathers	—	—

(1) The amount reported represents the aggregate grant date fair value of stock awards granted as estimated pursuant to FASB ASC 718, *Compensation—Share based compensation* (ASC 718). See Note 10 of Synlogic's accompanying audited financial statements included in this proxy statement/prospectus/information statement for the assumptions used in calculating this amount.

Synlogic does not currently have a director compensation policy and none of Synlogic's non-employee directors received any compensation for service during 2016 other than Mr. Leschly who received 76,136 incentive units of Synlogic, LLC, which vest over four years with 25% of the incentive units vesting on the first anniversary of the date Mr. Leschly joined the board of directors of Synlogic, LLC, and the remainder vesting one forty-eighth (1/48th) per month thereafter. As part of the Reorganization, the Synlogic, LLC incentive units were converted into shares of Synlogic Common Stock with continued vesting on the same terms as the incentive units under the Snylogic, LLC 2015 Plan. In addition, in 2017, Mr. Leschly was granted an option under the 2017 Plan to purchase 34,287 shares of Synlogic Common Stock at an exercise price of $7,48 per share, which was 29.17% vested on the date of the completion of the Reorganization and the balance of which will vest monthly through March 15, 2020. Synlogic provides reimbursement to all non-employee directors for reasonable out-of-pocket expenses incurred for attending meetings of the Synlogic Board of Directors or any committees thereof.

Mirna's director compensation for the fiscal year ended December 31, 2016 is set forth under the section entitled "*Mirna Directors, Officers and Corporate Governance—Director Compensation*" in this proxy statement/prospectus/information statement. The combined organization will provide the same compensation to non-employee directors as currently provided under the Mirna Non-Employee Director Compensation Program and each of Synlogic's current non-employee directors will receive an initial equity award effective as of the date of the Closing.

MATTERS BEING SUBMITTED TO A VOTE OF MIRNA STOCKHOLDERS

PROPOSAL NO. 1:
APPROVAL OF THE MERGER AND THE ISSUANCE OF COMMON STOCK IN THE MERGER

At the Annual Meeting, Mirna Stockholders will be asked to approve the Merger and the issuance of Mirna Common Stock to Synlogic Stockholders pursuant to the Merger Agreement. Immediately following the Merger, it is expected that Synlogic Stockholders and Synlogic Optionholders will own, or hold rights to acquire, approximately 83% of the fully-diluted Mirna Common Stock, and Mirna Stockholders (including holders of shares of Mirna Common Stock received upon the automatic exercise, pursuant to the Merger Agreement, of any existing Mirna Options having an exercise price per share less than the Mirna Closing Price) as of immediately prior to the Merger owning approximately 17% of the fully-diluted Mirna Common Stock, subject to adjustment based on the Exchange Ratio as set forth in the Merger Agreement.

Changes in the amount of Mirna's net cash between the signing of the Merger Agreement and the Closing could result in relative ownership percentages that are different than those described above.

The terms of, reasons for and other aspects of the Merger Agreement, the Merger and the issuance of Mirna Common Stock in the Merger are described in detail in the other sections in this proxy statement/prospectus/information statement. A copy of the Merger Agreement is attached to this proxy statement/prospectus/information statement as *Annex A*.

Required Vote

The affirmative vote of the holders of a majority of the outstanding shares of Mirna Common Stock entitled to vote at the Mirna Annual Meeting is required to approve Proposal No. 1.

THE MIRNA BOARD OF DIRECTORS RECOMMENDS THAT THE MIRNA STOCKHOLDERS VOTE "FOR" PROPOSAL NO. 1 TO APPROVE THE MERGER AND THE ISSUANCE OF MIRNA COMMON STOCK PURSUANT TO THE MERGER AGREEMENT.

PROPOSAL NO. 2:
APPROVAL OF AN AMENDMENT TO THE AMENDED AND RESTATED CERTIFICATE OF INCORPORATION OF MIRNA EFFECTING THE REVERSE STOCK SPLIT

General

At the Annual Meeting, Mirna Stockholders will be asked to approve an amendment to the amended and restated certificate of incorporation of Mirna effecting the Reverse Stock Split. Upon the effectiveness of the amended and restated certificate of incorporation of Mirna effecting the Reverse Stock Split (the "Split Effective Time"), the issued shares of Mirna Common Stock immediately prior to the Split Effective Time will be reclassified into a smaller number of shares such that a Mirna Stockholder will own one new share of Mirna Common Stock for every five to nine shares (or any number in-between and as determined by Mirna and Synlogic) of issued Mirna Common Stock held by that stockholder immediately prior to the Split Effective Time.

If Proposal No. 2 is approved, the Reverse Stock Split would become effective in connection with the Closing. The Mirna Board of Directors may affect only one reverse stock split in connection with this Proposal No. 2. The Mirna Board of Directors's decision will be based on a number of factors, including market conditions, existing and expected trading prices for Mirna Common Stock and the listing requirements of NASDAQ.

The form of the amendment to the amended and restated certificate of incorporation of Mirna to effect the Reverse Stock Split, as more fully described below, will affect the Reverse Stock Split but will not change the number of authorized shares of Mirna Common Stock or preferred stock, or the par value of Mirna Common Stock or Mirna preferred stock.

Purpose

The Mirna Board of Directors approved the proposal approving the amendment to the amended and restated certificate of incorporation of Mirna effecting the Reverse Stock Split for the following reasons:

- the Mirna Board of Directors believes effecting the Reverse Stock Split may be an effective means of avoiding a delisting of Mirna Common Stock from the NASDAQ Global Market in the future; and
- the Mirna Board of Directors believes a higher stock price may help generate investor interest in Mirna and help Mirna attract and retain employees.

If the Reverse Stock Split successfully increases the per share price of Mirna Common Stock, the Mirna Board of Directors believes this increase may increase trading volume in Mirna Common Stock and facilitate future financings by Mirna.

Requirements for Listing on the NASDAQ Global Market

Mirna Common Stock is quoted on the NASDAQ Global Market under the symbol "MIRN." Mirna intends to file an initial listing application with the NASDAQ Global Market to seek listing on the NASDAQ Global Market upon the Closing.

According to NASDAQ rules, an issuer must, in a case such as this, apply for initial inclusion following a transaction whereby the issuer combines with a non-NASDAQ entity, resulting in a change of control of the issuer and potentially allowing the non-NASDAQ entity to obtain a NASDAQ listing. Accordingly, the listing standards of NASDAQ will require Mirna to have, among other things, a $4.00 per share minimum bid price upon the Closing. Therefore, the Reverse Stock Split may be necessary in order to consummate the Merger.

One of the effects of the Reverse Stock Split will be to effectively increase the proportion of authorized shares which are unissued relative to those which are issued. This could result in Mirna's management being able

to issue more shares without further stockholder approval. For example, before the Reverse Stock Split, Mirna's authorized but unissued shares immediately prior to the Closing would be approximately 234,143,307 million compared to shares issued of approximately 20,856,693 million. If Mirna effects the Reverse Stock Split using a 1:5 ratio, its authorized but unissued shares immediately prior to the Closing would be approximately 4,171,339 million compared to shares issued of approximately 250,828,661 million. Mirna currently has no plans to issue shares, other than in connection with the Merger, and to satisfy obligations under Mirna Options from time to time as Mirna Options are exercised. The Reverse Stock Split will not affect the number of authorized shares of Mirna Common Stock, which will continue to be authorized pursuant to the certificate of incorporation of Mirna.

Potential Increased Investor Interest

On June 20, 2017, Mirna Common Stock closed at $1.53 per share. An investment in Mirna Common Stock may not appeal to brokerage firms that are reluctant to recommend lower priced securities to their clients. Investors may also be dissuaded from purchasing lower priced stocks because the brokerage commissions, as a percentage of the total transaction, tend to be higher for such stocks. Moreover, the analysts at many brokerage firms do not monitor the trading activity or otherwise provide coverage of lower priced stocks. Also, the Mirna Board of Directors believes that most investment funds are reluctant to invest in lower priced stocks.

There are risks associated with the Reverse Stock Split, including that the Reverse Stock Split may not result in an increase in the per share price of Mirna Common Stock.

Mirna cannot predict whether the Reverse Stock Split will increase the market price for the Mirna Common Stock. The history of similar stock split combinations for companies in like circumstances is varied. There is no assurance that:

- the market price per share of Mirna Common Stock after the Reverse Stock Split will rise in proportion to the reduction in the number of shares of Mirna Common Stock outstanding before the Reverse Stock Split;
- the Reverse Stock Split will result in a per share price that will attract brokers and investors who do not trade in lower priced stocks;
- the Reverse Stock Split will result in a per share price that will increase the ability of Mirna to attract and retain employees; or
- the market price per share will either exceed or remain in excess of the $1.00 minimum bid price as required by NASDAQ for continued listing, or that Mirna will otherwise meet the requirements of NASDAQ for inclusion for trading on the NASDAQ Global Market, including the $4.00 minimum bid price upon the Closing.

The market price of Mirna Common Stock will also be based on the performance of Mirna and other factors, some of which are unrelated to the number of shares outstanding. If the Reverse Stock Split is effected and the market price of Mirna Common Stock declines, the percentage decline as an absolute number and as a percentage of the overall market capitalization of Mirna may be greater than would occur in the absence of a reverse stock split. Furthermore, the liquidity of Mirna Common Stock could be adversely affected by the reduced number of shares that would be outstanding after the Reverse Stock Split.

Principal Effects of the Reverse Stock Split

The amendment to the amended and restated certificate of incorporation of Mirna effecting the Reverse Stock Split is set forth in *Annex D* to this proxy statement/prospectus/information statement.

The Reverse Stock Split will be effected simultaneously for all outstanding shares of Mirna Common Stock. The Reverse Stock Split will affect all of the Mirna Stockholders uniformly and will not affect any Mirna

Stockholder's percentage ownership interests in Mirna, except to the extent that the Reverse Stock Split results in any of the Mirna Stockholders owning a fractional share. Mirna Common Stock issued pursuant to the Reverse Stock Split will remain fully paid and nonassessable. The Reverse Stock Split does not affect the total proportionate ownership of Mirna following the Merger. The Reverse Stock Split will not affect Mirna continuing to be subject to the periodic reporting requirements of the Exchange Act.

Procedure for Effecting the Reverse Stock Split and Exchange of Stock Certificates

If the Mirna Stockholders approve the amendment to the amended and restated certificate of incorporation of Mirna effecting the Reverse Stock Split, and if the Mirna Board of Directors still believes that the Reverse Stock Split is in the best interests of Mirna and the Mirna Stockholders, Mirna will file the amendment to the amended and restated certificate of incorporation with the Secretary of State of the State of Delaware at such time as the Mirna Board of Directors has determined to be the appropriate Split Effective Time. The Mirna Board of Directors may delay effecting the Reverse Stock Split without resoliciting stockholder approval. Beginning at the Split Effective Time, each certificate representing pre-split shares will be deemed for all corporate purposes to evidence ownership of post-split shares.

As soon as practicable after the Split Effective Time, Mirna Stockholders will be notified that the Reverse Stock Split has been effected. Mirna expects that the Mirna transfer agent will act as exchange agent for purposes of implementing the exchange of stock certificates. Holders of pre-split shares will be asked to surrender to the exchange agent certificates representing pre-split shares in exchange for certificates representing post-split shares in accordance with the procedures to be set forth in a letter of transmittal to be sent by Mirna. In the event that Proposal No. 3 is approved, the certificates reflecting the post-split shares will also reflect the change of Mirna's corporate name to "Synlogic, Inc." No new certificates will be issued to a stockholder until such stockholder has surrendered such stockholder's outstanding certificate(s) together with the properly completed and executed letter of transmittal to the exchange agent. Any pre-split shares submitted for transfer, whether pursuant to a sale or other disposition, or otherwise, will automatically be exchanged for post-split shares. **Mirna Stockholders should not destroy any stock certificate(s) and should not submit any certificate(s) unless and until requested to do so.**

Fractional Shares

No fractional shares will be issued in connection with the Reverse Stock Split. Mirna Stockholders of record who otherwise would be entitled to receive fractional shares because they hold a number of pre-split shares not evenly divisible by the number of pre-split shares for which each post-split share is to be reclassified, will be entitled, upon surrender to the exchange agent of certificates representing such shares, to a cash payment in lieu thereof at a price equal to the fraction to which the stockholder would otherwise be entitled multiplied by the closing price of the Mirna Common Stock on the NASDAQ Global Market on the date immediately preceding the Split Effective Time. The ownership of a fractional interest will not give the holder thereof any voting, dividend, or other rights except to receive payment therefor as described herein.

By approving the amended and restated certificate of incorporation of Mirna effecting the Reverse Stock Split, Mirna Stockholders will be approving the combination of a range of five to nine shares (or any number in between) of Mirna Common Stock into one share of Mirna Common Stock.

Mirna Stockholders should be aware that, under the escheat laws of the various jurisdictions where Mirna Stockholders reside, where Mirna is domiciled, and where the funds will be deposited, sums due for fractional interests that are not timely claimed after the effective date of the split may be required to be paid to the designated agent for each such jurisdiction, unless correspondence has been received by Mirna or the exchange agent concerning ownership of such funds within the time permitted in such jurisdiction. Thereafter, Mirna Stockholders otherwise entitled to receive such funds will have to seek to obtain them directly from the state to which they were paid.

Potential Anti-Takeover Effect

Although the increased proportion of unissued authorized shares to issued shares could, under certain circumstances, have an anti-takeover effect, for example, by permitting issuances that would dilute the stock ownership of a person seeking to effect a change in the composition of the Mirna Board of Directors or contemplating a tender offer or other transaction for the combination of Mirna with another company, the Reverse Stock Split proposal is not being proposed in response to any effort of which Mirna is aware to accumulate shares of Mirna Common Stock or obtain control of Mirna, other than in connection with the Merger, nor is it part of a plan by management to recommend a series of similar amendments to the Mirna Board of Directors and Mirna Stockholders. Other than the proposals being submitted to the Mirna Stockholders for their consideration at the Annual Meeting, the Mirna Board of Directors does not currently contemplate recommending the adoption of any other actions that could be construed to affect the ability of third parties to take over or effect a change of control of Mirna. For more information, please see the section entitled "*Risk Factors—Risks Related to the Common Stock of Mirna*," and "*Description of Mirna Capital Stock—Anti-Takeover Effects of Provisions of Mirna Charter Documents*" and "*— Anti-Takeover Effects of Delaware Law.*"

Material U.S. Federal Income Tax Consequences of the Reverse Stock Split

The following discussion is a summary of the material U.S. federal income tax consequences of the Reverse Stock Split to U.S. Holders (as defined below) of Mirna Common Stock, but does not purport to be a complete analysis of all potential tax effects. The effects of other U.S. federal tax laws, such as estate and gift tax laws, and any applicable state, local or non-U.S. tax laws are not discussed. This discussion is based on the Code, U.S. Treasury regulations promulgated thereunder (the "Treasury Regulations"), judicial decisions, and published rulings and administrative pronouncements of the IRS, in each case in effect as of the date hereof. These authorities may change or be subject to differing interpretations. Any such change or differing interpretation may be applied retroactively in a manner that could adversely affect a holder of Mirna Common Stock. Mirna has not sought and will not seek an opinion of counsel or any rulings from the IRS regarding the matters discussed below. There can be no assurance the IRS or a court will not take a contrary position to that discussed below regarding the tax consequences of the Reverse Stock Split.

This discussion is limited to holders who hold their Mirna Common Stock as a "capital asset" within the meaning of Section 1221 of the Code (generally, property held for investment). This discussion does not address all U.S. federal income tax consequences relevant to the particular circumstances of a Mirna Stockholder, including the impact of the alternative minimum tax or the Medicare contribution tax on net investment income. In addition, it does not address consequences relevant to holders of Mirna Common Stock that are subject to special rules, including, without limitation:

- persons who are not U.S. Holders (as defined below);
- U.S. Holders (as defined below) whose functional currency is not the U.S. dollar;
- persons holding Mirna Common Stock as part of a hedge, straddle or other risk reduction strategy or as part of a conversion transaction or other integrated investment;
- banks, insurance companies and other financial institutions;
- real estate investment trusts or regulated investment companies;
- brokers, dealers or traders in securities;
- S corporations, partnerships or other entities or arrangements treated as partnerships for U.S. federal income tax purposes (and investors therein);
- tax-exempt organizations or governmental organizations;
- persons deemed to sell Mirna Common Stock under the constructive sale provisions of the Code;

- persons who hold or receive Mirna Common Stock pursuant to the exercise of any employee stock options or otherwise as compensation; and
- tax-qualified retirement plans.

For purposes of this discussion, a "U.S. Holder" is a beneficial owner of Mirna Common Stock that, for U.S. federal income tax purposes, is or is treated as:

- an individual who is a citizen or resident of the United States;
- a corporation created or organized under the laws of the United States, any state thereof or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust that (1) is subject to the primary supervision of a U.S. court and all substantial decisions of which are subject to the control of one or more "United States persons" (within the meaning of Section 7701(a)(30) of the Code) or (2) has a valid election in effect to be treated as a United States person for U.S. federal income tax purposes.

If an entity treated as a partnership for U.S. federal income tax purposes holds Mirna Common Stock, the tax treatment of a partner in the partnership will depend on the status of the partner, the activities of the partnership and certain determinations made at the partner level. Accordingly, partnerships holding Mirna Common Stock and the partners in such partnerships should consult their tax advisors regarding the U.S. federal income tax consequences to them.

In addition, the following discussion does not address the tax consequences of the Reverse Stock Split under state, local and foreign tax laws. Furthermore, the following discussion does not address any tax consequences of transactions effectuated before, after or at the same time as the Reverse Stock Split, whether or not they are in connection with the Reverse Stock Split.

HOLDERS OF MIRNA COMMON STOCK SHOULD CONSULT THEIR TAX ADVISORS WITH RESPECT TO THE APPLICATION OF THE U.S. FEDERAL INCOME TAX LAWS TO THEIR PARTICULAR SITUATIONS AS WELL AS ANY TAX CONSEQUENCES OF THE REVERSE STOCK SPLIT ARISING UNDER OTHER U.S. FEDERAL TAX LAWS (INCLUDING ESTATE AND GIFT TAX LAWS), UNDER THE LAWS OF ANY STATE, LOCAL OR NON-U.S. TAXING JURISDICTION OR UNDER ANY APPLICABLE INCOME TAX TREATY.

Tax Consequences of the Reverse Stock Split

The Reverse Stock Split should constitute a "recapitalization" for U.S. federal income tax purposes. As a result, a U.S. Holder of Mirna Common Stock generally should not recognize gain or loss upon the Reverse Stock Split, except with respect to cash received in lieu of a fractional share of Mirna Common Stock, as discussed below. A U.S. Holder's aggregate tax basis in the shares of Mirna Common Stock received pursuant to the Reverse Stock Split should equal the aggregate tax basis of the shares of the Mirna Common Stock surrendered (excluding any portion of such basis that is allocated to any fractional share of Mirna Common Stock), and such U.S. Holder's holding period in the shares of Mirna Common Stock received should include the holding period in the shares of Mirna Common Stock surrendered. Treasury Regulations provide detailed rules for allocating the tax basis and holding period of the shares of Mirna Common Stock surrendered to the shares of Mirna Common Stock received in a recapitalization pursuant to the Reverse Stock Split. U.S. Holders of shares of Mirna Common Stock acquired on different dates and at different prices should consult their tax advisors regarding the allocation of the tax basis and holding period of such shares.

Cash in Lieu of Fractional Shares

A U.S. Holder of Mirna Common Stock that receives cash in lieu of a fractional share of Mirna Common Stock pursuant to the Reverse Stock Split should recognize capital gain or loss in an amount equal to the

difference between the amount of cash received and the U.S. Holder's tax basis in the shares of Mirna Common Stock surrendered that is allocated to such fractional share of Mirna Common Stock. Such capital gain or loss should be long-term capital gain or loss if the U.S. Holder's holding period for Mirna Common Stock surrendered exceeded one year at the Split Effective Time.

Information Reporting and Backup Withholding

Payments of cash made in lieu of a fractional share of Mirna Common Stock may, under certain circumstances, be subject to information reporting and backup withholding. To avoid backup withholding, each holder of Mirna Common Stock that does not otherwise establish an exemption should furnish its taxpayer identification number and comply with the applicable certification procedures.

Backup withholding is not an additional tax. Any amounts withheld will be allowed as a credit against the holder's U.S. federal income tax liability and may entitle such holder to a refund, provided the required information is timely furnished to the IRS. Holders of Mirna Common Stock should consult their tax advisors regarding their qualification for an exemption from backup withholding and the procedures for obtaining such an exemption.

Required Vote

The affirmative vote of holders of a majority of the outstanding shares of Mirna Common Stock having voting power outstanding on the Record Date for the Annual Meeting is required to approve the amendment to the amended and restated certificate of incorporation of Mirna effecting the Reverse Stock Split, at a ratio mutually agreed to by Mirna and Synlogic in the range of one new share for every five to nine shares outstanding (or any number in between).

THE MIRNA BOARD OF DIRECTORS RECOMMENDS THAT MIRNA STOCKHOLDERS VOTE "FOR" PROPOSAL NO. 2 TO APPROVE AN AMENDMENT TO THE AMENDED AND RESTATED CERTIFICATE OF INCORPORATION OF MIRNA EFFECTING THE REVERSE STOCK SPLIT.

PROPOSAL NO. 3:
APPROVAL OF AN AMENDMENT TO THE AMENDED AND RESTATED CERTIFICATE OF INCORPORATION OF MIRNA EFFECTING THE MIRNA NAME CHANGE

At the Annual Meeting, Mirna Stockholders will be asked to approve an amendment to the amended and restated certificate of incorporation of Mirna to effect the Mirna Name Change. The primary reason for the corporate name change is that management believes this will allow for brand recognition of Synlogic's product candidates and product candidate pipeline following the consummation of the Merger. Mirna's management believes that the current name will no longer accurately reflect the business of Mirna and the mission of Mirna subsequent to the consummation of the Merger.

Required Vote

The affirmative vote of holders of a majority of the shares of Mirna Common Stock having voting power outstanding on the Record Date for the Annual Meeting is required to approve the amendment to the amended and restated certificate of incorporation to effect the Mirna Name Change.

THE MIRNA BOARD OF DIRECTORS RECOMMENDS THAT MIRNA STOCKHOLDERS VOTE "FOR" PROPOSAL NO. 3 TO APPROVE AN AMENDMENT TO THE AMENDED AND RESTATED CERTIFICATE OF INCORPORATION OF MIRNA EFFECTING THE MIRNA NAME CHANGE.

PROPOSAL NO. 4:
ELECTION OF DIRECTORS

At the Annual Meeting, Mirna Stockholders will vote on the election of two Class II directors to serve for a three-year term until Mirna's 2020 annual meeting of stockholders or until their successors are elected and qualified, or until his earlier death, resignation or removal. The Mirna Board of Directors has unanimously nominated Lawrence M. Alleva and Michael Powell, Ph.D., upon the recommendation of Mirna's nominating and governance committee, for reelection to the Mirna Board of Directors as Class II directors. The nominees have agreed to stand for election. If the nominees for Class II are elected at the Annual Meeting, then each nominee will serve for a three-year term expiring at the 2020 annual meeting of stockholders, or until his successor is elected and qualified, or until his earlier death, resignation or removal.

Mirna Stockholders should understand, however, that if the Merger is completed, the effect of the approval of Proposal No. 4 will be limited since the composition of the Mirna Board of Directors will be changed upon completion of the Merger in accordance with the Merger Agreement.

Required Vote

Mirna's directors are elected by a plurality of the votes cast. If a choice is specified on the proxy card by a stockholder, the shares will be voted as specified. If a choice is not specified on the proxy card, and authority to do so is not withheld, the shares will be voted "FOR" the election of the two nominees for Class II above. If any of the nominees becomes unavailable for election as a result of an unexpected occurrence, shares that would have been voted for the nominee will instead be voted for the election of a substitute nominee proposed by Mirna's management or the Mirna Board of Directors. Each person nominated for election has agreed to serve if elected. Mirna's management has no reason to believe that any nominee will be unable to serve.

THE MIRNA BOARD OF DIRECTORS RECOMMENDS A VOTE "FOR" THE ELECTION OF EACH THE CLASS II NOMINEES FOR DIRECTOR PURSUANT TO THIS PROPOSAL NO. 4.

PROPOSAL NO. 5:
RATIFICATION OF SELECTION OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The audit committee of the Mirna Board of Directors has selected Ernst & Young LLP ("EY"), as Mirna's independent registered public accounting firm for the year ending December 31, 2017. At the Annual Meeting, Mirna Stockholders will be asked to ratify the selection of EY as Mirna's independent registered public accounting firm for the calendar year ending December 31, 2017. EY has audited Mirna's financial statements for each year since the year ended December 31, 2014. Representatives of EY are expected to be present at the Annual Meeting. They will have an opportunity to make a statement if they so desire and will be available to respond to appropriate questions

Neither Mirna's bylaws nor other governing documents or law require stockholder ratification of the selection of EY as Mirna's independent registered public accounting firm. However, the audit committee is submitting the selection of EY to Mirna Stockholders for ratification as a matter of good corporate practice. If the Mirna Stockholders fail to ratify the selection, the audit committee will reconsider whether or not to retain EY. Even if the selection is ratified, the audit committee in its discretion may select a different independent registered public accounting firm at any time during the year if they determine that such a change would be in the best interests of Mirna and Mirna Stockholders.

Additionally, Mirna Stockholders should understand that if the Merger is completed, the effect of the approval of the ratification of the selection of EY as Mirna's independent registered public accounting firm for the year ending December 31, 2017 will be limited as the combined organization may decide to engage a new independent audit firm immediately or shortly after completion of the Merger.

Principal Accountant Fees and Services

For the calendar years ended December 31, 2016 and 2015, EY billed the approximate fees set forth below. All fees included below were approved by the audit committee.

	Year Ended December 31,	
	2016	2015
Audit Fees(1)	$ 305,000	$ 634,206
Audit-Related Fees	—	—
Tax Fees	—	—
All Other Fees	—	—
Total All Fees	$ 305,000	$ 634,206

(1) Consists of fees billed for professional services rendered for the audit of Mirna's annual financial statements, quarterly interim reviews, and services provided in connection with Mirna's securities offerings and registration statements.

Pre-Approval Policies and Procedures

The audit committee has adopted a policy for the pre-approval of all audit and non-audit services to be performed for Mirna by the independent registered public accounting firm. This policy is set forth in the charter of the audit committee and available at http://investor.mirnarx.com/corporate-governance.cfm. The audit committee approved all of the audit, audit-related, tax and other services provided by EY since Mirna's IPO in September 2015 and the estimated costs of those services. Actual amounts billed, to the extent in excess of the estimated amounts, are periodically reviewed and approved by the audit committee. The audit committee has considered the role of EY in providing audit and audit-related services to Mirna and has concluded that such services are compatible with EY's role as Mirna's independent registered public accounting firm.

Required Vote

The affirmative vote of a majority of the votes cast in person or by proxy (not counting "abstentions" or "broker non-votes" as votes cast) at the Annual Meeting will be required to approve the proposal to ratify the selection of EY as Mirna's independent registered public accounting firm for the calendar year ending December 31, 2017.

THE MIRNA BOARD OF DIRECTORS RECOMMENDS A VOTE "FOR" PROPOSAL NO. 5 TO RATIFY THE SELECTION OF ERNST & YOUNG LLP AS MIRNA'S INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM FOR THE FISCAL YEAR ENDING DECEMBER 31, 2017.

PROPOSAL NO. 6:
APPROVAL OF POSSIBLE ADJOURNMENT OF THE ANNUAL MEETING

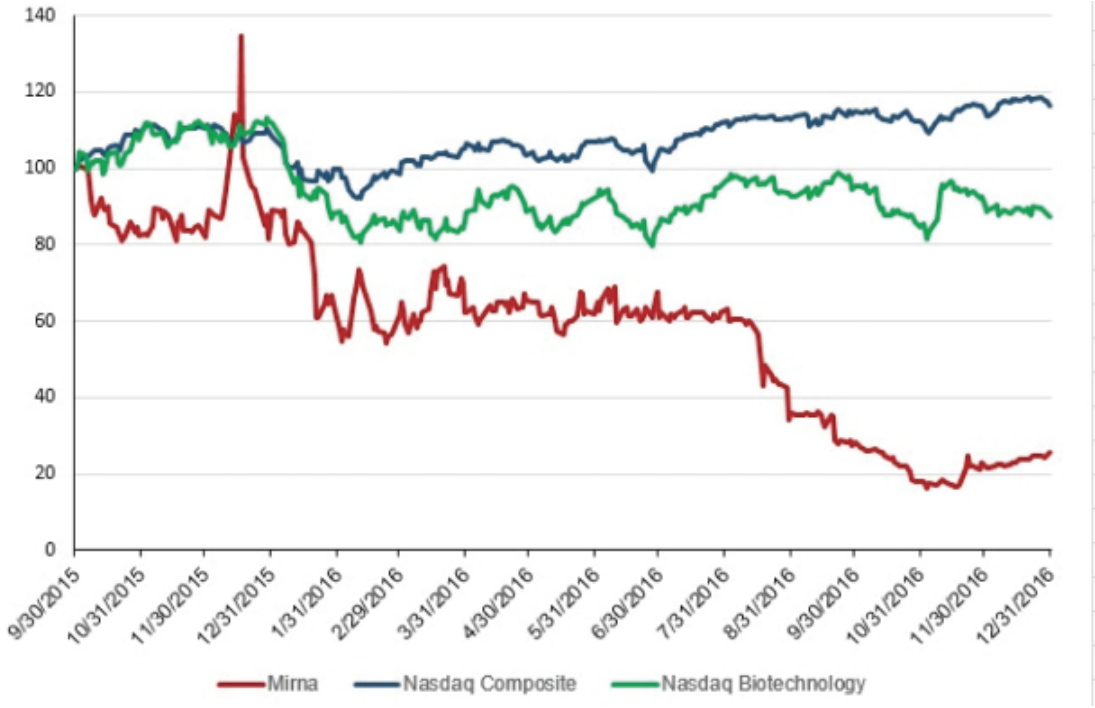
If Mirna fails to receive a sufficient number of votes to approve Proposal Nos. 1 or 2, Mirna may propose to adjourn the Annual Meeting, for a period of not more than 30 days, for the purpose of soliciting additional proxies to approve Proposal Nos. 1 or 2. Mirna currently does not intend to propose adjournment at the Annual Meeting if there are sufficient votes to approve Proposal Nos. 1 or 2. The affirmative vote of the holders of a majority of the shares of Mirna Common Stock having voting power present in person or represented by proxy at the Annual Meeting is required to approve the adjournment of the Annual Meeting for the purpose of soliciting additional proxies to approve Proposal Nos. 1 or 2.

THE MIRNA BOARD OF DIRECTORS RECOMMENDS THAT THE MIRNA STOCKHOLDERS VOTE "FOR" PROPOSAL NO. 6 TO ADJOURN THE ANNUAL MEETING, IF NECESSARY, TO SOLICIT ADDITIONAL PROXIES IF THERE ARE NOT SUFFICIENT VOTES IN FAVOR OF PROPOSAL NOS. 1 or 2. EACH OF PROPOSAL NOS. 1 and 2 ARE CONDITIONED UPON EACH OTHER AND THE APPROVAL OF EACH SUCH PROPOSAL IS REQUIRED TO CONSUMMATE THE MERGER.

PERFORMANCE GRAPH AND EQUITY PLAN TABLE

Performance Graph

The following graph illustrates a comparison of the total cumulative stockholder return on Mirna Common Stock since September 30, 2015, which is the date the Mirna Common Stock first began trading on the NASDAQ Global Market, to two indices: the NASDAQ Composite Index and the NASDAQ Biotechnology Index. The graph assumes an initial investment of $100 on September 30, 2015. The stockholder return shown in the graph below is not necessarily indicative of future performance, and Mirna does not make or endorse any predictions as to future stockholder returns. This graph shall not be deemed "soliciting material" or be deemed "filed" for purposes of Section 18 of the Exchange Act, or otherwise subject to the liabilities under that Section, and shall not be deemed to be incorporated by reference into any of Mirna's filings under the Securities Act, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.



Equity Compensation Plan Information

The following table provides certain information as of December 31, 2016, with respect to all of Mirna's equity compensation plans in effect on that date.

Plan Category	Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights (a)	Weighted-Average Exercise Price of Outstanding Options, Warrants and Rights (b)	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Column (a)) (c)
Equity Compensation Plans Approved by Stockholders[1][2]	1,905,214	5.39	3,878,452
Equity Compensation Plans Not Approved by Stockholders	—	—	—
Total	1,905,214	5.39	3,878,452

(1) Includes the Mirna Therapeutics, Inc. 2015 Equity Incentive Award Plan, the Mirna Therapeutics, Inc. 2008 Long Term Incentive Plan, and the Mirna Therapeutics, Inc. 2015 Employee Stock Purchase Plan.

(2) The Mirna Therapeutics, Inc. 2015 Equity Incentive Award Plan and the Mirna Therapeutics, Inc. 2015 Employee Stock Purchase Plan contain "evergreen" provisions, pursuant to which (i) the number of shares of Mirna Common Stock reserved for issuance or transfer pursuant to awards under the 2015 Equity Incentive Award Plan shall be increased on the first day of each year beginning in 2016 and ending in 2025, in an amount equal to the lesser of (A) five percent (5.0%) of the shares of stock outstanding (on an as converted basis) on the last day of the immediately preceding calendar year and (B) such smaller number of shares of stock as determined by the Mirna Board of Directors; provided, however, that no more than 14,000,000 shares of stock may be issued upon the exercise of incentive stock options and (ii) the maximum number of shares of Mirna Common Stock which will be authorized for sale under the 2015 Employee Stock Purchase Plan is equal to the sum of (a) 167,180 shares of Mirna Common Stock and (b) an annual increase on the first day of each year beginning in 2016 and ending in 2025, equal to the lesser of (i) one percent (1.0%) of the shares of Mirna Common Stock outstanding (on an as converted basis) on the last day of the immediately preceding calendar year and (ii) such number of shares of Mirna Common Stock as determined by the Mirna Board of Directors; provided, however, that no more than 2,000,000 shares of Mirna Common Stock may be issued under the 2015 Employee Stock Purchase Plan.

MIRNA BUSINESS

Overview

Mirna is a biopharmaceutical company that has historically focused on microRNA-based oncology therapeutics, which are short ribonucleic acid ("RNA") molecules, or oligonucleotides.

Mirna's first product candidate, MRX34, a mimic of naturally occurring microRNA 34 (miR-34) encapsulated in a liposomal nanoparticle formulation, was studied as a single agent in a Phase 1 clinical trial. In September 2016, Mirna voluntarily halted the Phase 1 trial following multiple immune-related SAEs observed in patients dosed with MRX34 in the trial. Subsequently, Mirna received notification from the FDA that the IND for MRX34 was on full clinical hold. Following Mirna's suspension of the Phase 1 trial for MRX34 and the FDA's clinical hold on the IND for MRX34, Mirna discontinued development of MRX34 and Mirna's microRNA product pipeline, and closed its IND.

In November 2016, Mirna discontinued research and development activities to reduce operating expenses while Mirna evaluated strategic alternatives with a goal to enhance stockholder value, including the Merger or, if the Merger is not completed, the possibility of another merger or sale of Mirna. Mirna also initiated a plan in November 2016 to reduce personnel and expenses to preserve capital and further streamline Mirna's operations consistent with its decision to discontinue development of MRX34 and its microRNA product pipeline.

Following an extensive process of evaluating strategic alternatives for Mirna and identifying and reviewing potential candidates for a strategic acquisition or other transaction, on May 15, 2017, Mirna and Synlogic entered into the Merger Agreement under which Mirna would acquire Synlogic in a stock transaction. If the Merger is completed, the business of Mirna will become the business of Synlogic as described in the section entitled "*Synlogic Business*" in this proxy statement/prospectus/information statement for a description of the terms of these agreements.

Mirna expects to devote significant time and resources to completion of the Merger, or, if the Merger is not completed, identifying and evaluating other strategic alternatives. However, there can be no assurance that such activities will result in the completion of the Merger or any other agreements or transactions that will enhance shareholder value. Further, the completion of the Merger, or of any other strategic transaction, ultimately may not deliver the anticipated benefits or enhance shareholder value.

Mirna was incorporated in 2007 under the laws of Delaware and was maintained as a wholly owned subsidiary of its former parent company, Asuragen, Inc. ("Asuragen"), until the end of 2009, when Mirna became an independent entity.

Mirna's Strategy

Mirna's corporate strategy currently is focused on pursuing the Merger or, in the event the Merger is not completed, such other strategic initiatives as may enhance stockholder value. Mirna has also implemented operating cost reductions, organizational restructuring, including a recent reduction in Mirna's workforce, to reduce overall cash burn and facilitate Mirna's pursuit of strategic initiatives.

Mirna's Historical microRNA Platform

More than 10 years ago, while working at Ambion®, Mirna's scientists discovered through extensive microRNA expression and functional assay work that microRNAs are expressed differently in cancer tissue compared to normal adjacent tissue and that several naturally occurring microRNAs function as tumor suppressors by regulating the expression of key oncogenes and preventing the development, progression and dissemination of cancer.

To enable therapeutic application of these tumor suppressor microRNAs, Mirna pioneered technologies for creating RNA molecules that function as natural microRNAs when they enter human cells. These RNA molecules, which Mirna calls microRNA mimics, may be used to replace those tumor suppressor microRNAs that are lost, or under-expressed, in cancer cells. Mirna pioneered the development of therapeutic miRNA mimics that feature two complementary RNA strands that are hybridized to produce a double-stranded RNA. The active strand has a sequence that is identical to a microRNA normally expressed in a cell, while the second, passenger strand is modified to facilitate proper loading of the active strand onto the cytoplasmic protein complex, the RNA-Induced Silencing Complex ("RISC"), necessary for microRNA function inside the cells. While similar in structure, microRNA mimics are clearly differentiated from small interfering RNAs ("siRNAs") through their biological heritage and activity. In contrast to the man-made sequences of siRNAs that target a single gene, microRNA mimics function like naturally occurring microRNAs to orchestrate the expression of many different genes to enable normal cell development and function. Mirna believes its microRNA mimics have the mechanistic flexibility to be used as:

- first-line agents in combination with current standards of care, including targeted therapies, immuno-oncology therapies, chemotherapies and/or radiation therapies;
- monotherapies in advanced or refractory patient settings;
- monotherapies in patients who would be intolerant of current standards of care; and
- monotherapies in tumor settings that do not have any approved therapies.

Delivery of microRNA Mimics to Target Tissues

Systemic delivery of oligonucleotides, including microRNAs, has been a major challenge, principally due to the fact that after intravenous administration these molecules have to overcome multiple barriers before reaching their ultimate place of action, which is the RNA-induced silencing complex (RISC) in the cytoplasm of cells.

Mirna has evaluated a wide variety of proprietary delivery systems with its microRNA compounds for *in vivo* and *ex vivo* testing. Based on this testing, Mirna previously selected SMARTICLES® formulation technology, licensed from Marina Biotech, Inc. ("Marina") as the delivery technology for miR-34. miR-34 was the target tumor suppressor microRNA of Mirna's first product candidate MRX34. In September 2016, the FDA placed the IND for MRX34 on full clinical hold and Mirna has discontinued development of MRX34 and Mirna's microRNA product pipeline. In February 2017, Mirna closed the IND for MRX34 in the United States and Korea.

Product Pipeline

Prior to discontinuing its research and development activities in November 2016, Mirna was developing a pipeline of tumor suppressor microRNA mimics. Each microRNA mimic in Mirna's pipeline was designed to replicate the activity of a single tumor suppressor miRNA and regulate the expression of key oncogenes across multiple oncogenic pathways. Mirna was granted therapeutic use patent claims related to several tumor suppressor microRNAs as well as composition of matter claims for multiple chemistries and structures.

Through execution of Mirna's *in silico*, *in vitro* and *in vivo* analysis of multiple tumor suppressor microRNAs Mirna previously prioritized a pipeline of candidate molecules for further validation toward clinical candidate nomination. Before Mirna discontinued its research and development activities in November 2016, each of these candidates was previously studied for therapeutic potential in specific cancer indications, as set forth in the table below:

MicroRNA PROGRAM	KEY ONCOGENE TARGETS	PATHWAYS	CANCER INDICATION
miR-215	BCL2, BMI1, DHFR, IGF, IGFR1, MDM2, PIM1, WNK1, XIAP, ZEB1/2	Cell Cycle, Apoptosis, DNA Repair, EMT	Esophageal, Kidney, Multiple Myeloma
miR-101	MYCN, EZH2, ERK2, FOS, MCL1, COX2, DNMT3A, VEGF, MET, ZEB1/2	Angiogenesis, Cell Cycle, Apoptosis, EMT, Inflammation	Bladder, Gastric, Lung, Ovarian
miR-16	BCL2, VEGF-A, Cyclin-D1, HMGA1, FGFR1, CDK6, BMI1	Apoptosis, Autophagy, Angiogenesis, EMT, Cell Cycle	Chronic Lymphocytic Leukemia, Lymphoma
let-7	RAS, MYC, HMGA2, TGFBR1, MYCN, Cyclin D2, IL6, ITGB3	Cell Cycle, Angiogenesis, Cancer Stem Cell, EMT	Prostate, Pancreatic, Melanoma

MRX34

MRX34 is a double-stranded RNA mimic of the tumor suppressor microRNA, miR-34, encapsulated in a liposomal nanoparticle formulation called SMARTICLES. Based on pre-clinical data and a potential new mechanism for the treatment of cancer, Mirna opened IND applications in the United States and Korea and initiated Mirna's first-in-human Phase 1 clinical trial, titled MRX34-101. However, in September 2016, Mirna voluntarily halted the Phase 1 trial following multiple immune-related SAEs observed in patients dosed with MRX34 over the course of the trial. Three of these immune-related events resulted in the patient's death. Subsequently, Mirna received notification from the FDA that the IND for MRX34 was on full clinical hold. Following Mirna's suspension of the Phase 1 trial for MRX34 and the FDA's clinical hold on the IND for MRX34, Mirna discontinued development of MRX34 and Mirna's microRNA product pipeline. In February 2017, Mirna closed its INDs for MRX34 in the United States and Korea.

Intellectual Property

Mirna has previously worked to protect and enhance the proprietary technologies that it believed were important to Mirna's business, including seeking and maintaining patents intended to cover Mirna's products and compositions, their methods of use and any other inventions important to the development of Mirna's business. Mirna has also relied on trade secrets to protect aspects of Mirna's business that are not amenable to, or that it does not consider appropriate for, patent protection.

Mirna's Patent Portfolio

Mirna owns or in-licenses a portfolio of patents and patent applications that has protected various aspects of its business. The patents and patent applications that make up Mirna's patent portfolio have been primarily focused on various aspects of microRNA therapeutics. As of May 31, 2017, Mirna owned or in-licensed over 10 issued U.S. patents and over 42 pending U.S. and ex-U.S. patent applications. The expiration dates of the currently issued patents range from 2025 to 2032. Mirna also has multiple pending patent applications that, if issued, will expire between 2025 and 2035.

Patent Term

The term of individual patents and patent applications in Mirna's portfolio will depend upon the legal term of the patents in the countries in which they are obtained. In most countries, the patent term is 20 years from the date of filing of the patent application (or parent application, if applicable). For example, if an international Patent Cooperation Treaty ("PCT") application is filed, any patent issuing from the PCT application in a specific country expires 20 years from the filing date of the PCT application. In the United States, however, if a patent was in force on June 8, 1995, or issued on an application that was filed before June 8, 1995, that patent will generally have a term that is the greater of 20 years from the filing date or 17 years from the date of issue.

Under the Hatch-Waxman Act, the term of a patent that covers an FDA-approved drug or biological product may also be eligible for patent term extension ("PTE"). PTE permits restoration of a portion of the patent term of a U.S. patent as compensation for the patent term lost during product development and the FDA regulatory review process if approval of the application for the product is the first permitted commercial marketing of a drug or biological product containing the active ingredient. The patent term restoration period is generally one-half the time between the effective date of an IND and the submission date of a new drug application ("NDA"), plus the time between the submission date of an NDA and the approval of that application. The Hatch-Waxman Act permits the owner of a patent to apply for a PTE for only one patent applicable to an approved drug, and the maximum period of restoration is five years beyond the expiration of the patent. A PTE cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval, and a patent can only be extended once, and thus, even if a single patent is applicable to multiple products, it can only be extended based on one product. Similar provisions may be available in Europe and certain other foreign jurisdictions to extend the term of a patent that covers an approved drug. When possible, depending upon the length of clinical trials and other factors involved in the filing of an NDA, if Mirna resumes its research and development efforts, Mirna expects to apply for PTEs for patents covering its product candidates and their methods of use, or to work with Mirna's licensors, as owners of such patents, to obtain such extensions, if available.

Strategic Partnerships and Licenses

CPRIT

In August 2010, Mirna entered into a grant contract with CPRIT (the "2010 Contract"), under which Mirna received a $10.3 million commercialization award from the State of Texas through CPRIT. CPRIT was established to expedite innovation and commercialization in the area of cancer research and to enhance access to evidence-based prevention programs and services throughout the State of Texas. The award was a three-year award that was funded annually, and the contract terminated on January 31, 2014, subject to Mirna's obligations to make certain payments that survive termination. Under the terms of the award, Mirna will be required to pay to CPRIT a portion of Mirna's revenues from sales of certain products by Mirna, or received from Mirna's licensees or sublicensees, at a percentage in the low single digits until the aggregate amount of such payments equals a specified multiple of the grant amount, and thereafter at a rate of less than one percent, subject to Mirna's right, under certain circumstances, to make a one-time payment in a specified amount to CPRIT to buy out such payment obligations. Pursuant to a letter agreement and amendment entered into with CPRIT in May 2017, Mirna repaid CPRIT $5 million as consideration for the termination of certain grant repayment and other obligations under the 2010 Contract with CPRIT, among other changes to the 2010 Contract.

On September 1, 2015, Mirna entered into a new grant contract with CPRIT in connection with an approximately $16.8 million award, subject to extension by mutual agreement by Mirna and CPRIT. In October 2015, concurrent with Mirna's IPO, Mirna realized this 2015 award in the form of an agreement by CPRIT to purchase approximately $16.8 million of shares of Mirna Common Stock in a private placement. In contrast to Mirna's 2010 award, this 2015 award does not include any royalty obligation upon commercialization of Mirna's product candidates. In May 2017, Mirna terminated the grant contract entered in connection with the $16.8 million award, which provided for certain ongoing obligations of Mirna.

Manufacturing

In November 2016, Mirna discontinued further research and development activities to reduce operating expenses while Mirna evaluated strategic alternatives with a goal to enhance stockholder value, including the Merger or, if the Merger is not completed, the possibility of another merger or sale of Mirna. Mirna does not currently own or operate facilities for product manufacturing, storage and distribution or testing and Mirna has previously contracted with third parties to manufacture Mirna's compounds for nonclinical and clinical testing purposes.

Manufacturing is subject to extensive regulations that impose various procedural and documentation requirements, which govern recordkeeping, manufacturing processes and controls, personnel, quality control and quality assurance. If Mirna resumes research and development activities, Mirna's systems and contractors would be required to be in compliance with these regulations.

Drug Substance

Following Mirna's suspension of the Phase 1 trial for MRX34 and the FDA's clinical hold on the IND for MRX34, Mirna discontinued development of MRX34 and Mirna's microRNA product pipeline; however, Mirna previously used NITTO DENKO Avecia ("Avecia") to manufacture its MRX34 drug substance.

Drug Product

Mirna's drug product for its microRNA mimics consists of the drug substance formulated in the SMARTICLES liposomal delivery system. The drug product was provided as a concentrated, frozen aqueous solution that was defrosted, thawed and diluted for infusion in the clinic. The exclusive manufacturer of drug product for MRX34 was Polymun; however, this product candidate has been discontinued and Mirna has disposed of all of Mirna's finished product that was outstanding.

Research and Development

In November 2016, Mirna discontinued its research and development activities to reduce operating expenses while Mirna evaluated strategic alternatives with a goal to enhance stockholder value, including the Merger or, if the Merger is not completed, the possibility of another merger or sale of Mirna. Before Mirna discontinued its research and development activities, Mirna conducted clinical trials and other development activities to support the development of Mirna's product candidates. In the years ended December 31, 2016, 2015 and 2014, Mirna incurred $13.9 million, $18.9 million, and $10.5 million, respectively, of research and development expense.

Before Mirna discontinued its research and development activities, Mirna's research programs were directed toward the following:

- determining if biomarkers can be used to select cancer patients who are more likely to respond to MRX34 therapy;
- selecting and developing a second miRNA-based therapeutic candidate; and
- developing a next-generation systemic delivery technology to improve the tolerability and efficacy profiles of miRNA mimics and expand the cancer indications that can be targeted for therapeutic intervention.

Competition

The biotechnology and pharmaceutical industries are characterized by intense and rapidly changing competition to develop new technologies and proprietary products. If Mirna commences research and development activities, it would face potential competition from many different sources, including larger and better-funded pharmaceutical and biotechnology companies.

Government Regulation

The FDA and comparable regulatory authorities in state and local jurisdictions and in other countries impose substantial and burdensome requirements upon companies involved in the clinical development, manufacture, marketing and distribution of drugs, such as those Mirna is developing. These agencies and other federal, state and local entities regulate, among other things, the research and development, testing, manufacture, quality control, safety, effectiveness, labeling, storage, record keeping, approval, advertising and promotion, distribution, post-approval monitoring and reporting, sampling and export and import of Mirna's product candidates.

In the United States, the FDA regulates drug products under the Federal Food, Drug and Cosmetic Act (the "FFDCA"), and the FDA's implementing regulations. Drugs are also subject to other federal, state and local statutes and regulations. If Mirna fails to comply with applicable FDA or other requirements at any time during the drug development process, clinical testing, the approval process or after approval, Mirna may become subject to administrative or judicial sanctions. These sanctions could include, among other things, the FDA's refusal to approve pending applications, license suspension or revocation, withdrawal of an approval, warning letters, product recalls, clinical holds, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil penalties or criminal prosecution. Any FDA enforcement action could have a material adverse effect on Mirna.

FDA approval is required before any new unapproved drug or dosage form, including a new use of a previously approved drug, can be marketed in the United States. The process required by the FDA before a drug may be marketed in the United States generally involves:

- completion of extensive nonclinical laboratory tests, animal studies and formulation studies, many of which must be performed in accordance with the FDA's current Good Laboratory Practice ("cGLP") regulations;
- submission to the FDA of an IND which must become effective before human clinical trials in the United States may begin;
- approval by an independent IRB at each clinical trial site before each trial may be initiated;
- performance of adequate and well-controlled human clinical trials to establish the safety and efficacy of the drug candidate for each proposed indication in accordance with the FDA's current Good Clinical Practice ("cGCP") regulations;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the drug is produced to assess compliance with cGMP, regulations;
- submission to the FDA of an NDA;
- satisfactory completion of a review by an FDA advisory committee, if applicable; and
- FDA review and approval of the NDA prior to any commercial marketing, sale or shipment of the drug.

The completion of nonclinical testing, clinical trials and the review and approval process requires substantial time, effort and financial resources, and, if Mirna resumes its research and development activities, Mirna cannot be certain that any approvals for its product candidates will be granted on a timely basis, if at all. Nonclinical tests include laboratory evaluation of product chemistry, formulation, stability and toxicity, as well as animal studies to assess the characteristics and potential safety and efficacy of the product. The results of nonclinical tests, together with manufacturing information, analytical data and a proposed clinical trial protocol and other information, are submitted as part of an IND to the FDA. Some nonclinical testing may continue even after the IND is submitted. An IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA, within the 30-day time period, raises concerns or questions relating to any of the submitted data including the proposed clinical trial and places the clinical trial on a clinical hold. In such a case, the IND sponsor and the

FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, a submission of an IND may not result in FDA authorization to commence a clinical trial. A separate submission to an existing IND must also be made for each successive clinical trial conducted during product development.

Clinical trials involve the administration of the investigational drug to human subjects under the supervision of qualified investigators. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical trial, the parameters to be used in monitoring safety and the effectiveness criteria to be used. Each protocol must be submitted to the FDA as part of the IND. An IRB for each medical center proposing to conduct a clinical trial must also review and approve a plan for any clinical trial before it can begin at that center and the IRB and the sponsor must monitor the clinical trial until it is completed. The FDA or the sponsor, or an IRB with respect to its institution, may suspend or discontinue a clinical trial at any time on various grounds, including a finding that the subjects are being exposed to an unacceptable health risk. Clinical testing also must satisfy cGCP requirements, including the requirement to obtain effective informed consent from study subjects.

All clinical research performed in the United States in support of an NDA must be performed under an IND. However, a sponsor that wishes to conduct a clinical trial outside the United States may, but need not, obtain FDA authorization to conduct the clinical trial under an IND. If a foreign clinical trial is not conducted under an IND, the sponsor may submit data from the clinical trial to the FDA in support of an NDA so long as the clinical trial is conducted in compliance with an international guideline for the ethical conduct of clinical research known as the Declaration of Helsinki and/or the laws and regulations of the country or countries in which the clinical trial is performed, whichever provides the greater protection to the participants in the clinical trial.

Clinical Trials

For purposes of NDA submission and approval, clinical trials are typically conducted in three or four sequential phases, which may overlap or be combined.

- *Phase 1:* Clinical trials are initially conducted in a limited population of subjects to test the drug candidate for safety, dose tolerance, absorption, metabolism, distribution and excretion in healthy humans or, on occasion, in patients with severe problems or life-threatening diseases to gain an early indication of its effectiveness.
- *Phase 2:* Clinical trials are generally conducted in a limited patient population to evaluate dosage tolerance and appropriate dosage, identify possible adverse effects and safety risks, and evaluate preliminarily the efficacy of the drug for specific indications in patients with the disease or condition under study.
- *Phase 3:* Clinical trials are typically conducted when Phase 2 clinical trials demonstrate that a dose range of the product candidate is effective and has an acceptable safety profile. Phase 3 clinical trials are commonly referred to as “pivotal” trials, which typically denotes a clinical trial that has the potential to result in enough data to support a determination by the FDA that the drug is safe and effective for its intended use. Phase 3 clinical trials are generally undertaken with large numbers of patients, such as groups of several hundred to several thousand, to further evaluate dosage, to provide substantial evidence of clinical efficacy and to further test for safety in an expanded and diverse patient population at multiple, geographically-dispersed clinical trial sites.
- *Phase 4:* In some cases, the FDA may condition approval of an NDA for a product candidate on the sponsor’s agreement to conduct additional clinical trials after NDA approval. In other cases, a sponsor may voluntarily conduct additional clinical trials post-approval to gain more information about the drug. Such post approval trials are typically referred to as Phase 4 clinical trials.

The FDA, the IRB or the clinical trial sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects are being exposed to an unacceptable health risk.

Additionally, some clinical trials are overseen by an independent group of qualified experts organized by the clinical trial sponsor, known as a data safety monitoring board or committee. This group provides authorization for whether or not a trial may move forward at designated check points based on access to certain data from the study.

Concurrent with clinical trials, companies usually complete additional animal trials and must also develop additional information about the chemistry and physical characteristics of the drug and finalize a process for manufacturing the drug in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the drug candidate and, among other things, the manufacturer must develop methods for testing the identity, strength, quality and purity of the final drug product. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the drug candidate does not undergo unacceptable deterioration over its shelf life.

New Drug Applications

The results of nonclinical studies and of the clinical trials, including negative or ambiguous results as well as positive findings, together with other detailed information, including extensive manufacturing information and information on the composition of the drug, are submitted to the FDA in the form of an NDA requesting approval to market the drug for one or more specified indications. The FDA reviews an NDA to determine, among other things, whether a drug is safe and effective for its intended use.

Once an NDA has been accepted for filing, by law the FDA has 180 days to review the application and respond to the applicant. However, the review process is often significantly extended by FDA requests for additional information or clarification. Under the Prescription Drug User Fee Act, the FDA has a goal of responding to NDAs within 10 months of the filing date for standard review, but this timeframe is also often extended. The FDA may refer the application to an advisory committee for review, evaluation and recommendation as to whether the application should be approved. The FDA is not bound by the recommendation of an advisory committee, but it generally follows such recommendations. Before approving an application, the FDA will inspect the facility or the facilities at which the finished drug product, and sometimes the active drug ingredient, is manufactured, and will not approve the drug unless cGMP compliance is satisfactory. The FDA may also inspect the sites at which the clinical trials were conducted to assess their compliance, and will not approve the drug unless compliance with cGCP requirements is satisfactory.

After the FDA evaluates the NDA, it may issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the drug with specific prescribing information for specific indications. A Complete Response Letter indicates that the review cycle of the application is complete and the application is not ready for approval. A Complete Response Letter may require additional clinical data and/or an additional pivotal Phase 3 clinical trial(s), and/or other significant, expensive and time-consuming requirements related to clinical trials, nonclinical studies or manufacturing. Even if such data are submitted, the FDA may ultimately decide that the NDA does not satisfy the criteria for approval. Data from clinical trials are not always conclusive and the FDA may interpret data differently than Mirna interprets data. The FDA could also approve the NDA with a Risk Evaluation and Mitigation Strategy plan to mitigate risks, which could include medication guides, physician communication plans, or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. The FDA also may conditionally approve the NDA, among other things, requiring changes to proposed labeling, development of adequate controls and specifications, or a commitment to conduct one or more post-market studies or clinical trials. Such post-market testing may include Phase 4 clinical trials and surveillance to further assess and monitor the product’s safety and effectiveness after commercialization. Regulatory approval of oncology products often requires that patients in clinical trials be followed for long periods after approval to determine the overall survival benefit of the drug. The FDA has the authority to prevent or limit further marketing of a drug based on the results of these post-marketing programs.

Drugs may be marketed only for the FDA approved indications and in accordance with the provisions of the approved labeling. Further, if there are any modifications to the drug, including changes in indications, labeling,

or manufacturing processes or facilities, the applicant may be required to submit and obtain FDA approval of a new NDA or NDA supplement, which may require Mirna to develop additional data or conduct additional nonclinical studies and clinical trials. Depending on the nature of the change proposed, an NDA supplement must be filed and approved before the change may be implemented. For many proposed post-approval changes to an NDA, the FDA has up to 180 days to review the application. As with new NDAs, the review process is often significantly extended by the FDA requests for additional information or clarification.

The testing and approval processes require substantial time, effort and financial resources, and each may take several years to complete. Nonclinical and clinical data may be interpreted by the FDA in different ways, which could delay, limit or prevent regulatory approval. Mirna may encounter difficulties or unanticipated costs in its efforts to secure necessary governmental approvals, which could delay or preclude Mirna from marketing drugs. The FDA may limit the indications for use or place other conditions on any approvals that could restrict the commercial application of the drugs.

Other Regulatory Requirements

Any drugs manufactured or distributed by Mirna or its collaborators pursuant to FDA approvals would be subject to continuing regulation by the FDA, including recordkeeping requirements and reporting of adverse experiences associated with the drug. Drug manufacturers and their subcontractors are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with ongoing regulatory requirements, including cGMP, which impose certain procedural and documentation requirements upon Mirna and its third party manufacturers. Failure to comply with the statutory and regulatory requirements can subject a manufacturer to possible legal or regulatory action, such as warning letters, suspension of manufacturing, seizure of product, injunctive action or possible civil penalties.

The FDA closely regulates the post-approval marketing and promotion of drugs, including standards and regulations for direct-to-consumer advertising, off-label promotion, industry-sponsored scientific and educational activities and promotional activities involving the internet. A company can make only those claims relating to safety and efficacy that are approved by the FDA. Failure to comply with these requirements can result in adverse publicity, warning letters, corrective advertising and potential civil and criminal penalties. Physicians may prescribe legally available drugs for uses that are not described in the product's labeling and that differ from those tested by Mirna and approved by the FDA. Such off-label uses are common across medical specialties. Physicians may believe that such off-label uses are the best treatment for many patients in varied circumstances. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, impose stringent restrictions on manufacturers' communications regarding off-label use.

Expedited Review and Accelerated Approval Programs

A sponsor may seek approval of its product candidate under programs designed to accelerate FDA's review and approval of NDAs. For example, Fast Track Designation may be granted to a drug intended for treatment of a serious or life-threatening disease or condition that has potential to address unmet medical needs for the disease or condition. The key benefits of fast track designation are potential eligibility for priority review, rolling review (submission of portions of an application before the complete marketing application is submitted), and accelerated approval, if relevant criteria are met. Based on results of clinical studies submitted in an NDA, upon the request of an applicant, the FDA may grant the NDA a priority review designation, which sets the target date for FDA action on the application at six months after the FDA accepts the application for filing. Priority review is granted where there is evidence that the proposed product would be a significant improvement in the safety or effectiveness of the treatment, diagnosis, or prevention of a serious condition. If criteria are not met for priority review, the application is subject to the standard FDA review period of 10 months after FDA accepts the application for filing. Priority review designation does not change the scientific/medical standard for approval or the quality of evidence necessary to support approval.

Under the accelerated approval program, the FDA may approve an NDA on the basis of either a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. Post-marketing studies or completion of ongoing studies after marketing approval are generally required to verify the drug's clinical benefit in relationship to the surrogate endpoint or ultimate outcome in relationship to the clinical benefit. In addition, the Food and Drug Administration Safety and Innovation Act which was enacted and signed into law in 2012, established the new Breakthrough Therapy designation. A sponsor may seek FDA designation of its product candidate as a breakthrough therapy if the drug is intended, alone or in combination with one or more other drugs, to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development.

Orphan Drug Designation and Exclusivity

Under the Orphan Drug Act, the FDA may grant orphan drug designation to drugs intended to treat a rare disease or condition, which is generally defined as a disease or condition that affects fewer than 200,000 individuals in the United States. Orphan drug designation must be requested before submitting an NDA. In the United States, orphan drug designation entitles a party to financial incentives such as opportunities for grant funding towards clinical trial costs, tax advantages and user-fee waivers. After the FDA grants orphan drug designation, the generic identity of the drug and its potential orphan use are disclosed publicly by the FDA. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process. The first NDA applicant to receive FDA approval for a particular active ingredient to treat a particular disease with FDA orphan drug designation is entitled to a seven-year exclusive marketing period in the United States for that product, for that indication. During the seven-year exclusivity period, the FDA may not approve any other applications to market the same drug for the same orphan indication, except in limited circumstances, such as a showing of clinical superiority to the product with orphan exclusivity or if FDA finds that the holder of the orphan drug exclusivity has not shown that it can assure the availability of sufficient quantities of the orphan drug to meet the needs of patients with the disease or condition for which the drug was designated. However, the FDA can still approve other drugs that have a different active ingredient for use in treating the same indication or disease. Mirna has not sought or obtained orphan drug designation for any of its product candidates.

Employees

As of May 31, 2017, Mirna had five full-time employees, of whom one has a medical degree. These employees are primarily engaged in assisting Mirna with the evaluation of strategic alternatives following the closure of Mirna's Phase 1 trial of MRX34, as well as finance, human resources and general management functions necessary to operate as a public company. Mirna has no collective bargaining agreements with its employees and has not experienced any work stoppages. Mirna considers its relations with its employees to be good.

About Mirna

Mirna was incorporated in late 2007 under the laws of Delaware and was maintained as a wholly owned subsidiary of its former parent company, Asuragen, Inc., until the end of 2009 when Mirna became an independent entity. Mirna completed the IPO of the Mirna Common Stock in October 2015. The Mirna Common Stock is currently listed on the NASDAQ Global Market under the symbol "MIRN." Mirna is an "emerging growth company" under the JOBS Act of 2012, and therefore is subject to reduced public company reporting requirements.

Mirna's principal executive offices are located at 1250 S. Capital of Texas Highway, Building 3, Suite 400, Austin, TX 78746 and Mirna's telephone number is (512) 901-0950. Mirna's website address is www.mirnarx.com. The information contained on, or that can be accessed through, Mirna's website is not part of this proxy statement/prospectus/information statement or any other filings Mirna makes with the SEC. Mirna has included its website address in this document solely as an inactive textual reference.

Available Information

Mirna makes available on or through its website certain reports and amendments to those reports that Mirna files with, or furnishes to, the SEC in accordance with the Exchange Act. These include Mirna's Annual Reports on Form 10-K, Mirna's Quarterly Reports on Form 10-Q and Mirna's Current Reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act. Mirna makes this information available on or through its website free of charge as soon as reasonably practicable after Mirna electronically files the information with, or furnishes it to, the SEC. Copies of this information may be obtained at the SEC's Public Reference Room at 100 F Street, NE, Washington, D.C. 20549. Information on the operation of the Public Reference Room may be obtained by calling the SEC at 1-800-SEC-0330. The SEC maintains a website that contains reports, proxy and information statements, and other information regarding Mirna's filings, at www.sec.gov. The information on, or that can be accessed through, Mirna's website is not incorporated by reference into this document or any other filings Mirna makes with the SEC.

Properties

Mirna's corporate headquarters are located in Austin, Texas and consist of approximately 924 square feet of office space for which Mirna has a lease that expires on June 30, 2017. Mirna believes that its existing facilities are sufficient for Mirna's needs for the foreseeable future.

Legal Proceedings

From time to time, Mirna is subject to various legal proceedings, claims and administrative proceedings that arise in the ordinary course of its business activities. Although the results of litigation and claims cannot be predicted with certainty, as of the date of this proxy statement/prospectus/information statement, Mirna does not believe it is party to any claim,

proceeding or litigation the outcome of which, if determined adversely to Mirna, would individually or in the aggregate be reasonably expected to have a material adverse effect on Mirna's business. Regardless of the outcome, litigation can have an adverse impact on Mirna because of defense and settlement costs, diversion of management resources and other factors.

SYNLOGIC BUSINESS

Overview

Synlogic™ is pioneering the development of Synthetic Biotic™ medicines: a novel class of living medicines intended to treat a broad range of human diseases, ranging from genetic and acquired metabolic disorders to inflammation and cancer. Synthetic Biotic medicines are generated from Synlogic's proprietary drug discovery and development platform. Synlogic applies the principles and tools of synthetic biology to engineer beneficial probiotic bacteria to perform or deliver critical therapeutic functions, compensating for missing or damaged pathways in patients with these serious diseases. As living medicines, Synthetic Biotic medicines are designed to sense a local disease context within a patient's body and to respond by metabolizing toxic substances or delivering combinations of therapeutic factors.

Synlogic's initial focus is on metabolic diseases with potential to be corrected following oral delivery of a living medicine to the gut. This includes a group of rare genetic diseases called inborn errors of metabolism ("IEMs"), as well as acquired metabolic diseases caused by organ dysfunction:

- Patients with certain IEMs are born with faulty genes that block the transformation of food into energy or prevent the elimination of toxic byproducts of metabolism.
- Patients with acquired metabolic diseases have similar defects in the metabolism of food, but these defects arise due to the impaired function of organs responsible for food metabolism, such as the liver.

In patients with these diseases, byproducts of failed metabolism can accumulate to toxic levels and cause serious health consequences throughout the body. Synthetic Biotic medicines are designed as oral therapies to act in the gut to convert toxic metabolites into non-toxic byproducts and, as a result, reduce toxic metabolite levels in the systemic circulation and tissues. Synthetic Biotic medicines are engineered to clear toxic metabolites specific to each metabolic disease and have the potential to provide meaningful benefits to patients suffering from these debilitating conditions.

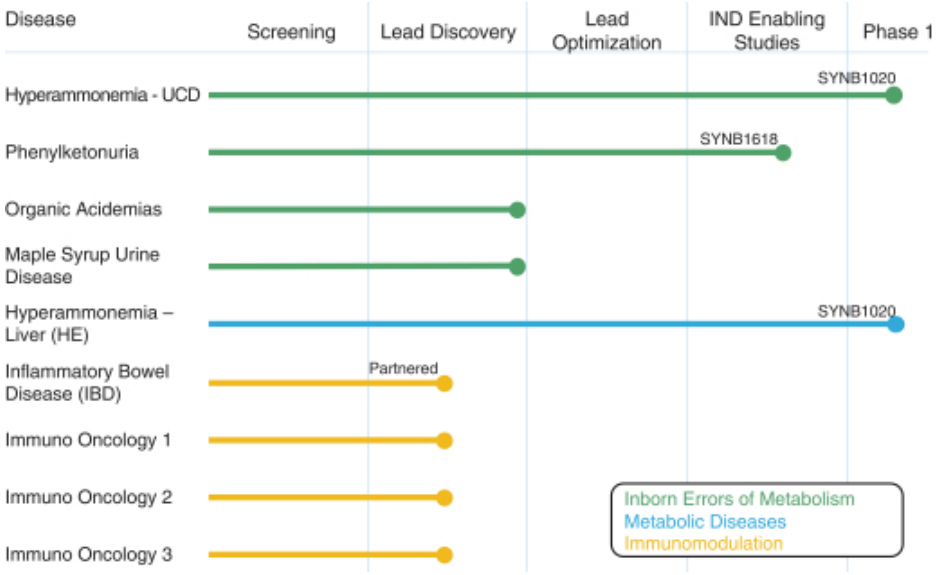
Synlogic initiated a Phase 1 clinical trial for its lead Synthetic Biotic program, SYNB1020, in June 2017. SYNB1020 is in development as an oral treatment for patients with hyperammonemia. In patients with hyperammonemia, ammonia accumulates in the body and becomes toxic leading to neurocognitive crisis and risk of long-term cognitive or behavioral impairment, coma, or death. Hyperammonemic conditions include a group of IEMs known as Urea Cycle Disorders ("UCD"), and hepatic encephalopathy ("HE") in liver disease patients. SYNB1020 is designed to remove excess ammonia from the gut by converting it into the beneficial amino acid arginine, with potential to result in lowered ammonia levels in the blood. Synlogic's second program, SYNB1618, is an oral therapy intended for the treatment of phenylketonuria ("PKU"), an IEM in which the amino acid phenylalanine accumulates as a result of genetic defects, becoming toxic to the brain and leading to neurological dysfunction. SYNB1618 is designed to have activity in the gut of patients to reduce excess phenylalanine to result in normalization of levels in the blood and tissues. Synlogic is planning to initiate a Phase 1 clinical trial for SYNB1618 in the first half of 2018. Synlogic's earlier metabolic disease pipeline includes discovery-stage product candidates for additional IEMs, such as maple syrup urine disease ("MSUD"), isovaleric acidemia ("IVA") and organic acidemias.

Synlogic's platform also has the potential to generate clinically meaningful therapies for patients affected by immune-mediated diseases and cancer. Synthetic Biotic medicines are designed to locally deliver combinations of complementary therapeutics to treat these complex disease states. Synlogic's portfolio of immuno-oncology programs is designed to deliver a combination of activities to modify the tumor microenvironment, activate the immune system and result in tumor reduction. In addition, Synlogic has established a strategic collaboration with the integrated pharmaceutical company AbbVie to develop Synthetic Biotic-based treatments for inflammatory bowel disease ("IBD") such as Crohn's disease and ulcerative colitis. While Synlogic intends to develop and commercialize therapeutic candidates for the treatment of IEMs on its own, Synlogic may consider entering additional strategic partnerships in the future to maximize the value of Synlogic's programs and its Synthetic Biotic platform.

To progress its pipeline, Synlogic collaborates with key disease experts who have developed robust models of relevant diseases to guide selection of Synlogic's development candidates and to inform its translational medicine strategy. Synlogic focuses on indications with clear biomarkers associated with disease progression that enable straightforward, early and ongoing assessment of potential clinical benefit throughout the development process. Synlogic's collaboration and intellectual property strategies additionally focus on building or leveraging existing third-party expertise in therapeutic research, pre-clinical and clinical development, regulatory affairs, manufacturing and commercialization, while also enhancing Synlogic's industry-leading position in synthetic biology and metabolic engineering.

Synlogic has assembled a management team of seasoned biopharmaceutical executives with extensive, relevant experience at leading pharmaceutical companies such as Pfizer Inc. ("Pfizer"), GlaxoSmithKline, Biogen, Inc. ("Biogen"), AstraZeneca, Millennium Pharamceuticals, Inc. ("Millennium Pharmaceuticals") (now Takeda Pharmaceutical Company Limited) and MedImmune, as well as the National Institute of Health. Synlogic is supported by the Synlogic Board of Directors and the Synlogic scientific advisory board, each of which offer complementary experience in drug discovery and development, as well as expertise in building public companies, management, and business development. Synlogic's founding science came from the labs of Professors James Collins and Timothy Lu from the Massachusetts Institute of Technology ("MIT"), who remain highly engaged in guiding development and application of Synlogic's platform.

Synlogic's pipeline of programs is shown below.



As Synlogic advances its lead programs, Synlogic continues to learn and improve the flexibility, manufacturability and translatability of its Synthetic Biotic platform, which will inform all future portfolio programs. Consequently, Synlogic believes it has a robust engine for building a sustainable pipeline of novel, living medicines across a range of diseases. Through the strength of Synlogic's internal team and network of partners, Synlogic believes it can deliver on the promise of Synthetic Biotic medicines to improve the lives of patients with significant unmet medical needs.

Synlogic's Strategy

Synlogic's goal is to use its Synthetic Biotic platform to design, develop and commercialize living medicines to transform the lives of patients for whom conventional treatment approaches are either not available or have limited efficacy and safety. To achieve its goal, Synlogic is pursuing the following key strategies:

Rapidly Advance Clinical Development of the SYNB1020 Hyperammonemia Program. Synlogic's lead Synthetic Biotic program is for the treatment of hyperammonemic conditions such as UCD and HE. SYNB1020 is an oral therapy designed to deliver a complementary metabolic pathway in the gut with the intended consequence of removing excess ammonia in the blood. SYNB1020 has received orphan drug designation for UCD from the FDA. Synlogic initiated its first Phase 1 clinical trial to assess safety, tolerability and pharmacokinetics in healthy volunteers in June 2017. Assuming success in the Phase 1 clinical trial, Synlogic plans to initiate an HE study to better understand safety, tolerability and therapeutic potential of SYNB1020. Synlogic expects to start the study in the first half of 2018 and to have topline data by the end of 2018. Similarly, based on the results of the Phase 1 clinical trial, Synlogic expects to begin a clinical trial in UCD by mid-2018 with data expected in the first half of 2019.

Complete IND-Enabling Activities to Advance SYNB1618 into Clinical Development. Synlogic's second IEM program is an oral therapy for PKU. SYNB1618 is designed to act from the gut to convert excess phenylalanine to non-toxic metabolites and thereby prevent phenylalanine from accumulating in the blood, becoming toxic and leading to neurological dysfunction. Synlogic expects to initiate a Phase 1 trial for this candidate in the first half of 2018. The Phase 1 design will include healthy volunteers, as well as an adult patient cohort, to assess safety, tolerability and pharmacodynamics. Synlogic expects to have final results from the healthy volunteer study, including insights from a mechanistic biomarker, by the end of 2018 and insights regarding therapeutic potential by the first half of 2019.

Expand Synlogic's Pipeline by Targeting Additional Rare Genetic Metabolic Diseases. Synlogic plans to continue to leverage its expertise from its lead programs to accelerate development of Synlogic's pipeline of clinical candidates for IEMs. For example, Synlogic's portfolio includes two additional discovery-stage Synthetic Biotic programs in lead optimization, including one for MSUD/ IVA and the other for propionic acidemia ("PA")/methylmalonic acidemia ("MMA"), diseases with high unmet need for which there are biomarkers that Synlogic believes can guide efficient product development programs.

Maximize the Value of the Synthetic Biotic Platform in Broader Metabolic and Inflammatory Diseases and in Immuno-Oncology Leveraging Strategic Partnerships. Synlogic's Synthetic Biotic platform and product discovery and development capabilities offer the potential to generate multiple clinically meaningful treatments for a broad set of metabolic and inflammatory diseases as well as cancer. For these indications, there is opportunity to reset a metabolic or immune dysfunction with a lower risk of systemic toxicity than other modalities. To achieve this, oral Synthetic Biotic medicines may be designed to deliver a combination of mechanisms following oral administration for activity in the gut or intra-tumoral injection. For example, Synlogic is establishing a discovery-stage immuno-oncology portfolio.

Synlogic expects to continue to explore strategic partnerships that would leverage the complementary capabilities of its partners to develop Synthetic Biotic medicines for these broader groups of patients in need. Synlogic's current partnership with AbbVie is focused on the discovery and development of Synthetic Biotic-based therapies for the treatment of IBD, and in June 2017 Synlogic announced its first milestone for this program. While Synlogic intends to develop and commercialize its programs for IEMs, Synlogic may consider entering into additional strategic partnerships to maximize the value of its Synthetic Biotic platform in these more common indications.

Expand the Synthetic Biotic Platform to Lead in the Discovery and Development of Additional Living Medicines and Enabling Technologies. Synlogic intends to advance in the field of living medicines by

continuing to innovate and broaden the potential of its Synthetic Biotic platform to deliver clinically meaningful benefits for patients. Synlogic plans to build on its expertise in design, optimization and manufacturing to further develop the Synthetic Biotic platform as a reproducible and scalable engine for generating a pipeline of product candidates that address a broad range of diseases.

Protect and Leverage Synlogic's Intellectual Property Portfolio and Patents. Synlogic believes that it has a broad intellectual property portfolio that includes patents and patent applications relevant to the engineering, development, manufacturing and formulation of human therapeutic products based on synthetic biology and the metabolic engineering of probiotics. Synlogic intends to continue to protect and leverage its intellectual property assets by maintenance and expansion of its worldwide portfolio of intellectual property, including through the pursuit of composition of matter and other intellectual property directed to its Synthetic Biotic programs and its technology platform.

Synlogic's Focus: Living Medicines

Synlogic is developing and advancing a novel approach to creating living medicines—therapeutics designed to sense a local disease context within a patient's body and to respond by metabolizing toxic substances or delivering combinations of therapeutic factors. Synlogic applies the tools and principles of synthetic biology to engineer beneficial probiotic bacteria to perform or deliver critical therapeutic functions, compensating for missing or damaged pathways in patients with metabolic diseases, inflammation and cancer.

Synlogic believes living medicines have unique advantages as potential therapeutics. Living biologic cells can carry out functions that cannot be performed by many conventional drug treatments, such as small molecules or antibodies. While many conventional treatments can address one molecular dysfunction, living medicines can compensate for the dysfunction of entire processes or pathways missing in disease and required for health. By contrast to conventional therapeutics that engage a single target, living medicines can be designed to dynamically sense diseased environments and respond with a programmed and combinatorial effect. Moreover, a living medicine can also function "catalytically," as a single living cell can carry out multiple cycles of the intended therapeutic activity during its time in the patient.

There is opportunity to expand the impact that previous cell therapies have had by applying the well-established tools of synthetic biology to probiotic bacteria, converting them into efficient therapeutic engines. Probiotic bacteria are non-pathogenic bacteria isolated from the human microbiota widely used as supplements believed to provide health benefits. To confer a therapeutic effect, Synlogic leverages basic biological properties of bacteria to develop engineered probiotics. Bacteria have evolved over several billion years to adapt, survive, and carry out active metabolism in many different environments. They are also amenable to genetic manipulation. Synlogic's intention is to lead in the discovery and development of Synthetic Biotic therapies as safe living medicines capable of robust and precise pathway complementation and therapeutic benefit.

Leveraging Synthetic Biology and Metabolic Engineering of Probiotic Bacteria to Produce Living Medicines

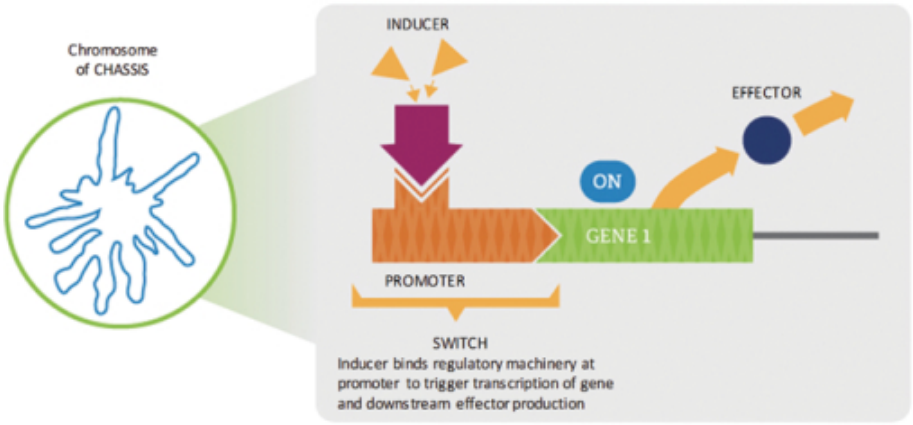
Synlogic's proprietary Synthetic Biotic discovery and development platform combines synthetic biology and metabolic engineering to re-design the genetic circuitry of beneficial probiotic bacteria and generate living medicines.

Synthetic Biology

Synthetic biology is an emerging and rapidly-evolving discipline that applies engineering principles to biological systems to enable rational, design-based control of cellular function for a specific purpose. Biological systems are governed by DNA sequences, or genes, that code for the production and regulation of proteins, metabolites and other molecules. The regulation of the function of proteins occurs via complex biochemical and cellular reactions working through intricate signaling pathways. Synthetic biology allows manipulation of these pathways to direct a desired therapeutic outcome. While efforts have been made to apply these principles across industries, Synlogic believes it is a leader in deploying synthetic biology for the treatment of human disease.

Synlogic scientists genetically engineer a beneficial probiotic bacterium with "wiring" or biological circuits to direct cellular biological processes in a manner analogous to designing electrical circuits. The critical parts of an engineered Synthetic Biotic medicine include (1) the chassis, or probiotic bacterium, (2) the effector module, which is a gene or pathway encoding the core biological activity that provides the therapeutic function, and (3) tunable switches to precisely determine the circumstances under which the effector module will be activated, as well as the strength, performance and output of the effectors themselves. Synlogic aims to precisely control the amount, location and activity of its Synthetic Biotic medicines to address a broad range of disease.

Schematic of the Synthetic Biotic Platform Components: Chassis, Effector, Switch



Metabolic Engineering of Probiotic Bacteria

(1) The Chassis: Synlogic's Synthetic Biotic platform employs well-characterized bacteria used as probiotics to serve as the chassis upon which Synlogic builds its living medicines. Synlogic's initial programs use *E. coli* Nissle, which is one of many non—pathogenic strains isolated from the human microbiota. *E. coli* Nissle has been used as a probiotic bacterial supplement for the last 20 years to promote gut health. *E. coli* Nissle is a non-colonizing probiotic in that it has recently been shown in the clinic to be rapidly cleared from most individuals with no significant safety issues. Synlogic believes *E. coli* Nissle's widespread use as a probiotic is evidence of its utility as a safe background chassis to apply synthetic biology to confer a therapeutic effect.

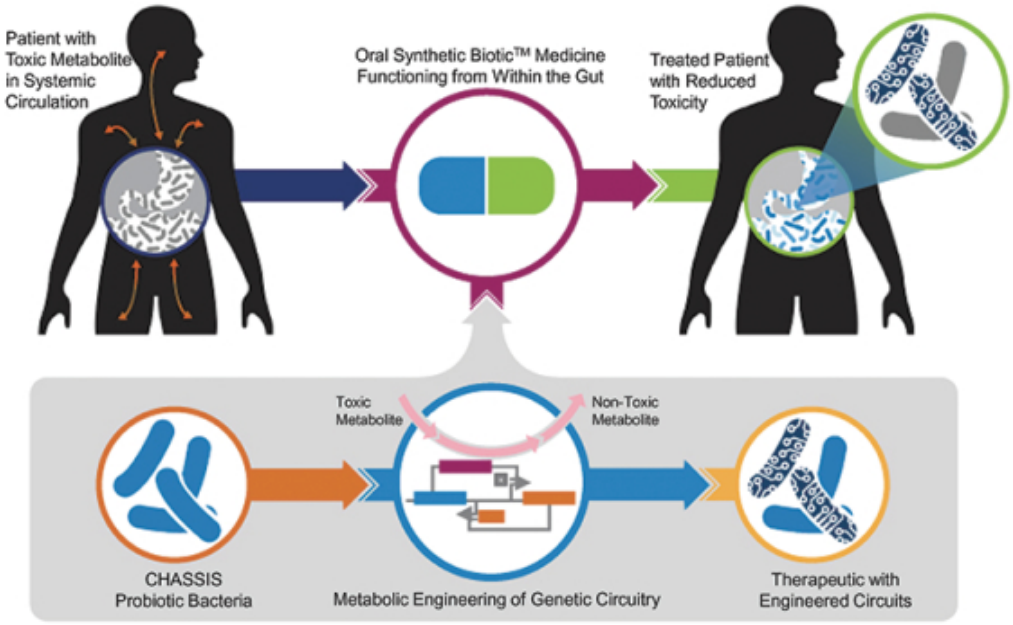
(2) Building the Effector Module: E. coli Nissle's metabolic systems are well-understood and extremely adaptable, making it an excellent organism for introducing new or enhanced activities to treat human disease. The highly flexible nature of its genetic and metabolic machinery provides a robust cellular context into which genetic information encoding proteins and pathways to correct for disease can be introduced with high efficiency and little or no damage to the fitness of the bacterium. This provides the potential for excellent reproducibility, stability, and activity during manufacturing. Moreover, the advanced nature of the synthetic biology toolkit available for *E. coli* Nissle enables the rapid iterative design, assembly, and testing of prototype product candidates and remains unique among other bacterial and cellular engineering approaches. Synlogic has leveraged proprietary tools, know how and intellectual property to build multiple Synthetic Biotic lead strains that produce a therapeutically relevant effect in laboratory experiments. Progression of these strains as product candidates in diseases with high unmet need is based on prioritizing those with feasible drug development paths in terms of availability of informative animal models and existence of biomarkers to guide efficient clinical development.

(3) Tunable Switches: Synlogic also designs and engineers proprietary switches to mediate the activity of the new pathways it introduces, with the aim of controlling the therapeutic output, or effector, of Synthetic Biotic

medicines. To optimize the fitness of a Synthetic Biotic strain, it is critical that the effector is activated only at the proper time and place. The switches Synlogic has developed are based on engineering DNA elements call “inducible promoters” to sense and respond to disease states, specific environmental signals, or exogenously added inducing molecules. The goal is to discover and develop Synthetic Biotic medicines programmed with switches to produce its therapeutic effect at precisely the right time and location such as the anaerobic environment of the gut, in the context of local inflammation, and in response to other pathogenic factors.

While applicable across metabolic, inflammatory and immuno-oncology indications, Synlogic’s initial Synthetic Biotic programs are designed for rare metabolic diseases in which a toxic metabolite accumulates in the body and causes systemic toxicity. Synlogic believes that the Synthetic Biotic platform can be leveraged to engineer a safe probiotic with enhanced genetic circuitry and the capability to transform a toxic metabolite into one that is non-toxic or even beneficial. The resulting Synthetic Biotic medicines are built to be taken orally and function from within the gut. Metabolites produced by both a person’s organs and by our endogenous flora circulate or flux between the human gastrointestinal (“GI”) tract and blood circulation and vice versa. As Synlogic’s Synthetic Biotic medicines transit through the GI tract, they are designed to have activity in the gut and to take advantage of this flux, ultimately reducing the systemic levels of toxic metabolites in the blood to treat rare metabolic diseases.

Schematic of the Synthetic Biotic Platform to Engineer Probiotic Bacteria



Advantages of Synlogic’s Synthetic Biotic Living Medicines

Synlogic believes its platform has the potential to provide safe and effective therapies for patients given several attributes of Synlogic’s Synthetic Biotic approach:

Unique Mechanisms to Treat Systemic Metabolic and Immune Dysfunction: Local Pathway Complementation or Therapeutic Delivery

Synlogic’s Synthetic Biotic platform allows it to engineer living medicines that act as engines capable of metabolic pathway compensation and essentially replace what a patient cannot do with his or her somatic organs,

such as the liver. Unlike traditional small molecule and biologic therapeutics, Synthetic Biotic medicines can be designed with multiple pathway components optimized to consume or transform unwanted metabolites or produce those that are medically beneficial. This approach is well suited to regulate the amount of a metabolic byproduct in a patient's body, particularly when there is unconstrained metabolite flux between the systemic circulation. Synlogic's Synthetic Biotic programs for rare metabolic diseases are designed to be dosed orally, to act locally while transiting through the gut and, as a consequence, to decrease toxic metabolite levels in the blood, thereby providing a systemic therapeutic benefit to the patient.

In addition, Synlogic is developing Synthetic Biotic medicines with the potential to normalize function of a dysregulated immune system. In inflammatory and autoimmune indications, this may be achieved by producing anti-inflammatory metabolites and proteins particularly for diseases of the GI tract. Synthetic Biotic medicines can also be designed to consume or produce metabolites or secrete and display proteins that may shift the tumor microenvironment of the immune system towards anti-tumor activity.

Combination and Local Delivery of Multiple Mechanisms in One Therapy for Greater Efficacy and Enhanced Safety

Currently, many complex diseases, such as inflammatory and autoimmune indications and oncology, require that patients be treated with a combination of therapeutic agents, often resulting in poor tolerability, multiple adverse events and increased cost of therapy. Synlogic's approach is to leverage the adaptability of *E. coli* Nissle to enable the combination of multiple activities into one therapy, which therefore could have greater efficacy while avoiding the impact of multiple separate systemic therapies.

Moreover, Synlogic's Synthetic Biotic medicines are based on beneficial probiotic bacteria derived from the natural human gut. A chassis such as *E. coli* Nissle is suited for local delivery, either orally or through intra-tumoral injection. Synlogic believes that, when delivered locally, Synthetic Biotic medicines have the potential to avoid the risks of dose-limiting side effects often associated with systemic therapies, especially when combinations of systemic therapies are required.

Ability to Tune and Enhance Efficacy in Context of Disease

Synlogic's Synthetic Biotic platform includes a suite of switches to permit precise control of the timing and amount of therapeutic effect produced. Synthetic Biotic therapies may be designed such that they are activated to produce the desired effect in a particular disease environment, such as sites of inflammation. This tuning has the potential to increase the therapeutic window by increasing the margin between the level of medicine needed for efficacy relative to the risk of systemic toxic side effects.

Advantages of Synlogic's Synthetic Biotic Drug Development Platform

The Synthetic Biotic platform employs a well-characterized probiotic bacterium with a proven safety record that is readily modified using state-of-the-art synthetic biology tools. This unique combination of features allows Synlogic to rapidly develop prototypes for the treatment of human diseases with unmet medical need. Advantages to discovery, development, manufacturing and commercialization, include unique mechanisms of action enabling a broad range of therapeutic applications and rational design to achieve predictable drug-like properties:

Unique Mechanisms of Action Enabling a Broad Range of Therapeutic Applications

Synlogic's approach allows it to engineer two types of mechanistic activities into Synlogic's Synthetic Biotic medicines. These activities may be further improved for therapeutic effect when combined or when under the control of tunable switches that determine when the mechanisms should be activated.

- *Metabolic Pathway Complementation*: Synthetic Biotic medicines may be programmed with entire pathways to degrade unwanted molecules or produce those that are beneficial. Synlogic believes

metabolic pathway complementation is advantageous as compared to gene, RNA or enzyme replacement therapies that are limited to targeting a single gene or protein defect and may require several unique drug products to address genetically heterogeneous patient populations. By compensating with an entire pathway, Synthetic Biotic medicines may provide a therapeutic solution to broader disease populations as a single engineered therapeutic. Moreover, in the IEMs space Synlogic believes its approach has advantages versus these other modalities that may be limited by delivery, transduction efficiency, duration of therapeutic expression and unclear potential for long-term dosing. Given the potential for chronic oral dosing, Synthetic Biotic medicines may have benefits in terms of prediction of dose, reversibility of activity and more traditional pricing strategies.

- *Production of One or More Protein Effectors at the Site of Disease*: Combinations of cytokine, antibody and protein therapies have potential for great effect, but can be restricted by dose-limiting side effects when administered systemically. The potential to program the control of expression of one or more proteins at the local disease site represents a unique approach to targeted therapy. Synlogic has developed proprietary integration systems to direct stable insertion of multiple genetic circuits and pathways into optimal chromosomal locations, or "landing pads," of *E.* coli Nissle. This enables efficient expression of multiple genes encoding desired enzymes and other proteins. Synlogic has also developed approaches to enhance the secretion of protein effectors to the extracellular environment. For example, in the case of inflammatory conditions, Synthetic Biotic medicines may be programmed to detect inflammation and respond with the production of one or more anti-inflammatory molecules. In oncology, Synlogic's programs are being designed to secrete effectors to promote immune system activity against a tumor. These activities may further be combined with metabolic complementation pathways. By incorporating multiple actions, Synthetic Biotic medicines have the potential to address complex diseases while avoiding the risk of systemic toxicity and reducing development costs associated with combining systemic therapies.

Rational Design to Achieve Predictable Drug-like Properties

Synlogic has demonstrated the ability to move a program from concept to clinical development in as little as three years for its lead program. Features of Synlogic's Synthetic Biotic platform enable a highly efficient drug discovery and development process and have the potential to advance product candidates more rapidly and efficiently than is typically possible with other novel or emerging modalities. These include:

- *Single Strain as Safe Chassis*. There are several benefits of employing a single, safe and well-characterized probiotic bacterium such as *E. coli* Nissle as the background chassis. First, because Synlogic's lead programs are based on *E. coli* Nissle, experience can be leveraged broadly across the portfolio, further optimizing the efficiency and reproducibility of discovery, development and manufacturing efforts. Next, the non-colonizing nature of *E. coli* Nissle can be combined with engineering approaches to optimize safety in terms of impact on the patient and the environment. *E. coli* Nissle can be engineered to require a specific exogenous nutrient supplement for growth, which limits the ability to replicate in the human body and environment. By controlling replication, Synlogic can control the number of cells being administered to a patient. Also, dependence on an essential nutritional supplement not available in the environment reduces biocontainment risk. Moreover, the risk of Synthetic Biotic medicines to the environment is further limited given that it is disadvantaged in terms of fitness due to its modifications.
- *Predictive Pharmacology and Biomarkers*. Synthetic Biotic programs are designed to achieve a target activity, and the platform supports an iterative design-build-test cycle to improve performance for achieving this target. For example, Synthetic Biotic programs can be optimized by including multiple copies or regulated control of certain genes, by adding transporters for particular substrates or by optimizing enzymes for basic bacterial metabolism. These tools enable rational and iterative engineering cycles in the discovery phase.

  Biomarkers as indicators of mechanistic and clinical activity may also be engineered into Synthetic Biotic medicines from the beginning to drive optimization and decision-making. By assessing the

activities of Synlogic's Synthetic Biotic programs in *in vitro* and *in vivo* pre-clinical models, Synlogic can model activity in humans. As Synlogic progresses into clinical studies, Synlogic expects its predictive pharmacology models will be further refined to inform dosing and development decisions for its additional programs.

- *Stability and Manufacturing.* Synlogic's lead Synthetic Biotic programs have advanced the platform by defining manufacturing processes that can be deployed against the entire portfolio. Manufacturing efforts have demonstrated reproducibility, yield and stability during small, medium and Phase 1 clinical-scale manufacturing efforts. Moreover, Synlogic's use of synthetic biology switches permits the precise control of engineered metabolic pathway activation. This can be used to suppress effector activity during manufacturing, enabling generation of biomass and robust, cost-efficient scale up of product candidates.

Synlogic's Product Pipeline

Synlogic's approach to selecting its initial programs is based on the potential of the Synthetic Biotic platform to uniquely address conditions in which there is (1) unmet medical need with (2) well understood biology that is (3) based on an imbalance of a metabolite and (4) where that metabolite is available within or originates from the gut lumen. Additional considerations include the availability of animal models, relevant biomarkers and feasible clinical development paths. Synlogic's initial clinical and pre-clinical programs are focused on certain IEMs that share these characteristics. When delivered orally, Synthetic Biotic medicines are designed to act from the gut to compensate for the dysfunctional metabolic pathway with the intended consequence of reducing the levels of the toxic metabolites systemically. Synlogic believes success in IEMs will enable it to demonstrate the potential of its oral Synthetic Biotic medicines to address metabolic dysfunction, while bringing meaningful change to lives of patients suffering from these debilitating conditions.

Synlogic's two lead therapeutic programs are being developed for the treatment of IEMs; UCD and PKU. There is unmet need for both indications, as well as an opportunity to reduce toxic metabolites that originate from the gut. Both also inform the potential of the Synthetic Biotic platform in unique ways. Synlogic's lead product candidate, SYNB1020, is designed as an oral therapy to remove excess ammonia from the blood by accessing ammonia in the lower GI tract and converting it into arginine, a natural amino acid used in normal growth and metabolism. The conversion of ammonia into arginine is based on enhancing an enzyme pathway endogenous to *E. coli* Nissle. The program has clinical application in that multiple disease indications involve toxic ammonia levels. In addition to UCD, Synlogic is exploring SYNB1020 to treat patients with HE secondary to chronic liver disease to stave off episodes of cognitive dysfunction. SYNB1020 has also received orphan drug designation for UCD from the FDA. Synlogic initiated a Phase 1 clinical trial of SYNB1020 in healthy volunteers in June 2017.

Synlogic's second IEM program, SYNB1618 for PKU, is designed to act in the upper GI tract to reduce excess phenylalanine in the blood. Unlike SYNB1020, the engineering of SYNB1618 is based on leveraging enzymes from other bacterial species to optimize the conversion of phenylalanine to non-toxic metabolites. SYNB1618 has demonstrated activity in a rodent model of PKU. Synlogic expects to initiate a Phase 1 clinical trial for this program in the first half of 2018. Synlogic's research-stage IEM portfolio includes Synthetic Biotic programs for (1) MSUD and IVA and (2) PA/MMA. These are rare metabolic deficiencies with no approved therapies in which the toxic accumulation of leucine and organic acids, respectively, can lead to neurological decline and death.

For more common metabolic, inflammatory and immuno-oncology indications with more complex biology, clinical and commercial paths, Synlogic will explore strategic partnerships to exploit the potential of the Synthetic Biotic platform. Synlogic's collaboration with AbbVie for the discovery and development of Synthetic Biotic therapies for the treatment of IBD is one such example. Synlogic is also developing a portfolio of immuno-oncology programs using a rational approach to select combinations of relevant mechanisms to address

specific tumor types. Synlogic's strategy is to alter the state of the tumor microenvironment to one that is "anti-tumor" through Synthetic Biotic medicines that consume or combine effectors that promote immune system activation, reverse immunosuppression, expand tumor antigen-specific T cells and/or remodel the tumor protective stroma to tip the balance toward an anti-tumor effect. Synlogic is currently working on three discovery-stage programs, which are diversified in terms of indications, combinations of mechanisms and routes of administration.

Synlogic's Initial Programs: Overview of IEMs

Patients with IEMs are born with faulty genes that result in the loss of a necessary enzyme function in an essential metabolic pathway and prevent the body from metabolizing commonly occurring byproducts of digestion. In patients with IEMs, these byproducts can accumulate to toxic levels in the gut and systemically throughout the body to cause serious health consequences, including irreversible neurological dysfunction. Although in some cases diet modification can be beneficial, unmet medical need remains as there are few current treatments for IEMs.

While there are hundreds of genetic conditions grouped as IEMs, individual IEMs are considered orphan diseases, with each disease affecting fewer than 200,000 patients in the United States and fewer than five per 10,000 people in the European Union. IEMs include diseases of the urea cycle, amino acid metabolism and organic acid accumulation, among others. Many IEMs are thought to be underdiagnosed given the rarity of the conditions, potential for infant death, lack of available diagnostics and limited therapies.

SYNB1020 for Hyperammonemia: Urea Cycle Disorder and Hepatic Encephalopathy

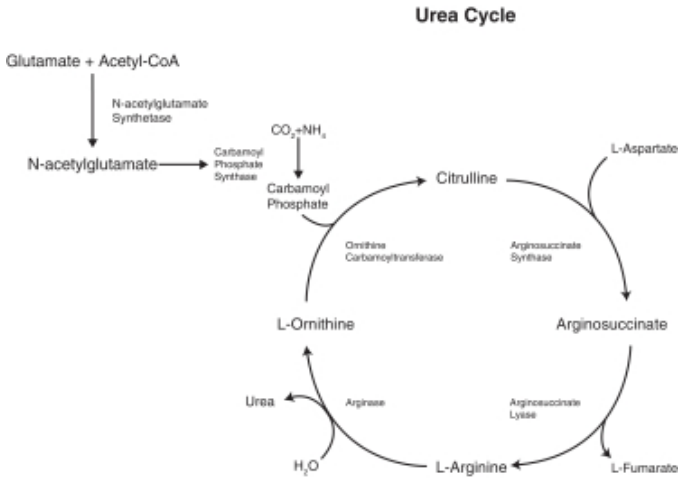
Hyperammonemia is a metabolic condition characterized by an excess of ammonia in the blood. In healthy individuals, ammonia is primarily produced in the intestine as a byproduct of protein metabolism and microbial degradation of nitrogenous-containing compounds. Ammonia itself is then converted to urea in the liver and is excreted in urine. However, if the liver's ability to convert ammonia to urea is compromised, either due to a genetic defect or acquired liver disease, ammonia accumulates in the blood. Elevated blood ammonia levels are toxic to the brain and can have severe consequences including neurologic crises requiring hospitalization, irreversible cognitive damage and death.

SYNB1020, Synlogic's lead Synthetic Biotic program, is a genetically engineered strain of *E. coli* Nissle designed to deliver a complementary metabolic pathway to the gut to reduce excess ammonia in the blood in individuals with disease. The SYNB1020 program offers potential in treating multiple indications associated with toxic ammonia levels, including UCD and HE, and has demonstrated reduction in blood ammonia levels in rodent models of hyperammonemia. SYNB1020 has received orphan drug designation for UCD from the FDA. Synlogic initiated a Phase 1 clinical trial of SYNB1020 in healthy volunteers in June 2017. Assuming success in this study, Synlogic plans to initiate two studies in UCD and HE to better understand the safety and tolerability of SYNB1020 in patients. Synlogic intends to clinically explore ammonia lowering in these patients to drive design of confirmatory studies for SYNB1020.

Overview of UCD

UCDs are a group of rare but serious and potentially fatal, genetic diseases. The urea cycle is an enzymatic pathway in which waste nitrogen, produced as a byproduct of protein metabolism, is converted into urea by the liver and eliminated from the body through urine. Patients with a UCD carry a deficiency in one of the six enzymes necessary for completion of the urea cycle, resulting in accumulation of waste nitrogen throughout the body in the form of ammonia, a substance that is highly toxic even in small amounts.

Functional Urea Cycle



UCD patients have intermittent periods of hyperammonemia, the symptoms of which can range from mild (loss of appetite, vomiting, and lethargy) to a severe hyperammonemic crisis associated with long-term cognitive or behavioral impairment, toxic encephalopathy, and even death. Symptoms often depend on the severity of the enzyme deficiency, and patients with the most severe disease present shortly after birth. Hyperammonemia in newborn infants due to UCD could be catastrophic and is associated with 24% mortality. Patients with later onset disease could suffer from a period of hyperammonemia that is often triggered by stress or illness (surgery, trauma, or drugs) resulting in severe neurological symptoms and associated with a high risk of mortality.

While it is difficult to estimate the exact incidence and prevalence of UCD, as it is thought that many patients go undiagnosed, it is estimated that UCD occurs in approximately one in 35,000 births in the United States. Based on analysis of the newborn screening data and demographic data from the UCD Longitudinal Registry Study sponsored by the NIH, Synlogic believes the size of the diagnosed prevalent population in the United States to be approximately 2,000 patients and that approximately two-thirds of these patients are under 18 years of age.

The mainstay of management of UCD is dietary protein restriction. Patients must carefully balance their protein intake to ensure the body receives adequate nutrients for growth and development, while avoiding triggering hyperammonemia. However, varying protein requirements and variable growth and activity levels often elicit episodes of hyperammonemia that can result in irreversible neurological damage. To supplement for the lower protein intake, patients may incorporate amino acid dietary formulations, such as L-citrulline or L-arginine, into their diet. However, dietary management remains challenging, especially in infants and children.

The only available drugs, sodium phenylbutyrate (Buphenyl®) and glycerol phenylbutyrate (Ravicti®), are approved for the chronic management of patients with UCD and create an alternate pathway for nitrogen/ammonia elimination from the body, but patients maintain protein restricted diets. Use of sodium phenylbutyrate is limited by pill burden, taste, and tolerability issues that can make compliance challenging. These therapies are mechanistically similar treatment options with limitations on maximal effect due to dose-related neurological safety issues (e.g., vomiting, nausea, headache, somnolence, confusion, or sleepiness) and enzymatic saturation and, therefore, the unmet need remains high.

When these management approaches fail to control chronic UCD-induced hyperammonemia, patients may be candidates for liver transplantation, which is potentially curative as it may correct the enzyme deficiency that causes UCD. However, aside from being very costly, transplants are limited by availability of donor organs and

are associated with potentially life-threatening risks and require life-long suppression of the immune system. Ultimately, morbidity and mortality remain high in UCD, and patients continue to suffer hyperammonemic crises. Synlogic believes that a truly transformative therapy for UCD would be an effective oral medicine without systemic toxicity that will maintain blood ammonia concentration at a safe level while allowing patients to eat a normal or only moderately restricted diet.

Overview of HE

The primary function of the liver is to filter out toxins, particularly ammonia, that are harmful if not sufficiently metabolized. In patients whose liver function is impaired, these toxins can accumulate in the blood stream and cause organ damage, particularly in the brain, which leads to a decline in brain function that is referred to as HE. Ammonia, a highly toxic substance produced in the body as a byproduct of protein metabolism, plays a key role in the development and prognosis of HE. While ammonia can be minimally metabolized by the brain in patients whose liver function is impaired, excessive ammonia levels can overwhelm the capacity of brain tissue and lead to a greater chance of developing brain swelling, coma and death for patients with HE. It is estimated that 30-45% of patients with chronic liver disease are affected by episodes of HE, and while many HE symptoms can be reversed with appropriate treatment, persistent impairment of memory and learning can occur.

HE severity is typically classified as covert or overt based largely on a patient's mental state. Covert HE is difficult to diagnose and is often observed in patients with cirrhosis who appear to have no obvious disorientation, but who display mild to moderate symptoms, such as difficulty concentrating, forgetfulness, changes in personality or behavior, and poor sleep. Patients with covert disease are at a higher risk of developing the more severe overt HE and have increasingly been recognized as a cause of morbidity linked with increased risk of traffic accidents and unemployment. Overt HE is associated with obvious mental disorientation and physical symptoms such as lethargy, seizures, tremors, organ failure, or brain swelling, that arise suddenly and may induce a coma or even death, particularly if not adequately treated. Overt HE is associated with a poor prognosis, with one-year survival estimates of 20% to 55%.

The current standard of care for overt HE includes lactulose, a non-absorbable disaccharide that prevents the absorption of ammonia in the gut. Lactulose is associated with GI side effects including both painful abdominal cramping and diarrhea. Non-absorbable antibiotics are also used to treat HE, often concurrently with lactulose. Rifaximin (Xifaxan®), a broad-spectrum antibiotic used to reduce growth of bacteria that produce ammonia in the colon, was approved for HE based on improvements in the duration of remission, reduced hospitalizations over six months, and improved quality of life in patients with HE. Although rifaximin and lactulose are used therapeutically for overt HE, there are no approved treatments for covert HE.

Morbidity and mortality associated with overt HE remains high and hospitalizations for HE impose a high burden on community resources. When current therapies fail to control overt HE, patients may be candidates for a potentially curative liver transplantation. However, aside from being costly, transplants are limited by availability of donor organs and are associated with potentially life-threatening risks and require life-long suppression of the immune system. There is a need for an effective therapy for patients with HE to stave off episodes of cognitive dysfunction and hospitalizations.

Synlogic believes that because ammonia is produced in the GI tract, a Synthetic Biotic medicine could be an effective therapeutic to reduce the levels of excess ammonia in the blood of patients with UCD and HE without the need for severe protein restriction and risk of systemic toxicities.

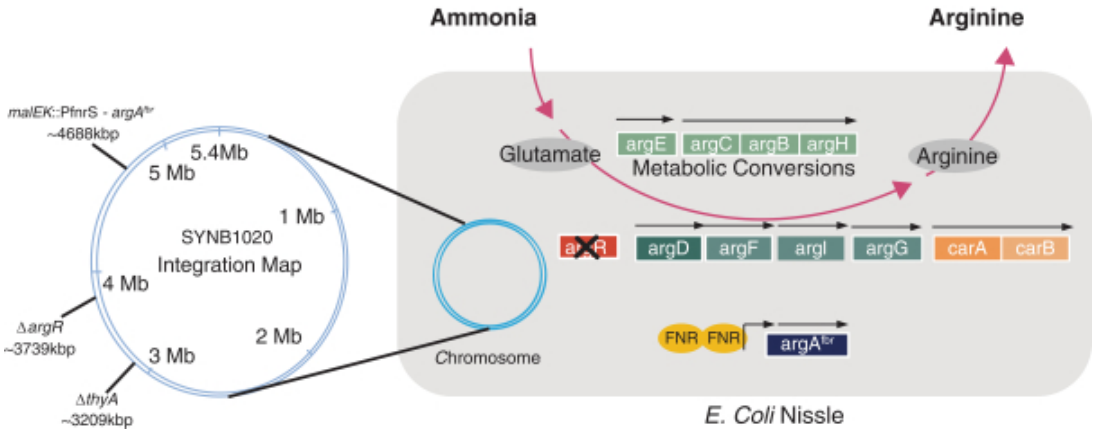
SYNB1020 Design

SYNB1020, Synlogic's lead Synthetic Biotic program, is an orally administered, engineered strain of *E. coli* Nissle. SYNB1020 was designed to complement the missing enzyme functions in patients with UCD with an

enhanced pathway to consume ammonia, thus having the potential to treat the spectrum of enzyme deficiencies that underlie UCD. This mechanism also has applicability in liver disease where there is a need to reduce excess ammonia in the colon before it can be absorbed into the blood and cause HE episodes.

Synlogic's approach was to create a Synthetic Biotic medicine that would continuously consume excess ammonia where it is naturally produced in the colon, before it can be absorbed into the blood, and produce arginine. Arginine production is deficient in UCD patients due to a defect in the urea cycle, and patients are often treated with arginine supplements. *E. coli* Nissle has an endogenous arginine production pathway that uses four molecules of ammonia for every new molecule of arginine produced. Synlogic modified this pathway to significantly enhance arginine production function through two key modifications: (1) deletion of a gene that represses the production of the arginine biosynthetic enzymes (*argR*) and (2) insertion of a gene that encodes a feedback-resistant enzyme in the arginine biosynthesis pathway ("*argA*^{fbr}"). To enhance activity, *argA*^{fbr} is placed under the control of an inducible promoter, FNR, to allow expression of the gene when the cell experiences micro-aerobic or anaerobic environments, such as the mammalian gut.

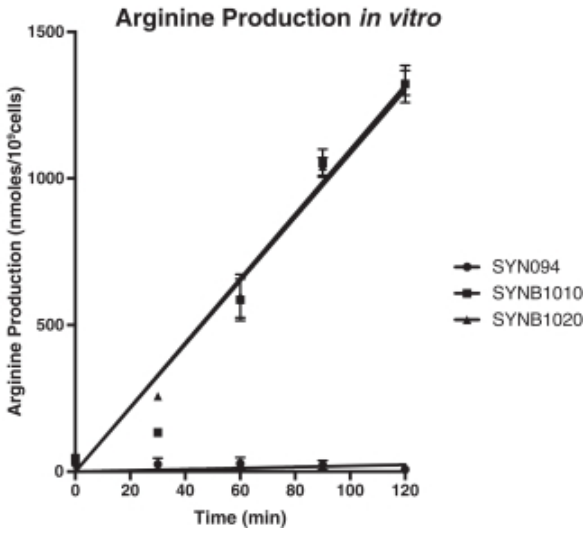
Schematic of SYNB1020



Abbreviations: argA = N-acetylglutamate synthase gene; argA^{fbr} = feedback resistant N-acetylglutamate synthase; ArgB = acetylglutamate kinase; ArgC = N-acetyl glutamylphosphate reductase; ArgD = N-acetylornithine aminotransferase; ArgE = acetylornithine deacetylase; ArgFI = ornithine carbamoyltransferase; ArgG = arginosuccinate synthase; ArgH = arginosuccinate lyase; argR = arginine repressor gene; CarAB = carbamoylphosphate synthetase; FNR = fumarate and nitrate reductase; P_{fnrS} = fumarate and nitrate reductase regulator sensor promoter; DthyA = thymidylate synthase such that the strain can only grow in thymidine-rich environments. Arrows denote operons.

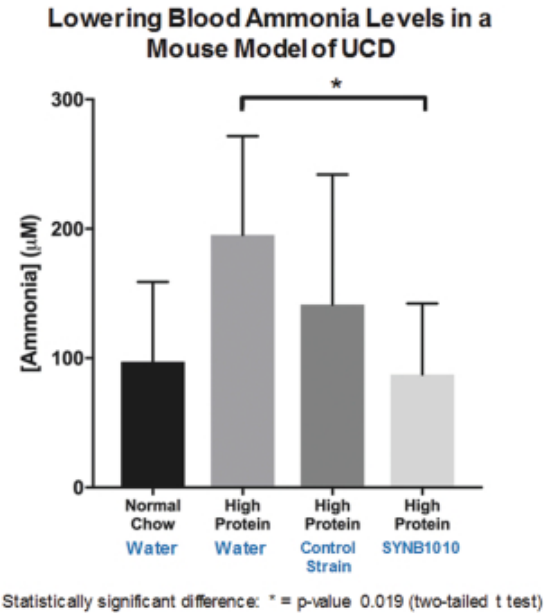
SYNB1020 Nonclinical Program

In an *in vitro* study, SYNB1020 and a related research strain SYNB1010 (identical to SYNB1020 except designed to grow in the presence of kanamycin for selection and use in pre-clinical studies) consumed ammonia and produced arginine at substantially higher rates compared with a control strain of *E. coli* Nissle that had not been engineered ("SYN94"). Arginine production was 650.1 and 658.7 nmol/10^9 cells/hour for SYNB1010 and SYNB1020, respectively, and only 11.8 nmol/10^9 cells/hour for the control strain. Similarly, conversion of ammonia to arginine was 2545 and 2570 nmol/10^9 cells/hour for SYNB1010 and SYNB1020, respectively, and 46 nmol/10^9 cells/hour for the control strain.



Pre-Clinical Efficacy Study

To test the *in vivo* activity in a setting of hyperammonemia, the spf-ash/F1 mouse was adapted from a published model based on a mutation in the gene for ornithine transcarbamylase ("OTC"), a common deficiency in human UCDs. The activity of the research strain SYNB1010 was compared to a non-arginine producing control strain of *E. coli* Nissle, and to water as an additional control. All mice were dosed orally, twice daily beginning on Day 1. Hyperammonemia was induced on Day 3 by switching animals to a high-protein diet. SYNB1010 reduced Day 5 blood ammonia levels in comparison with water and the non-arginine producing control strain of *E. coli* Nissle. This reduction in blood ammonia resulted in improved survival of animals dosed with SYNB1010 compared to animals given water or the non-arginine producing control strain.



Pre-Clinical Safety Study

In a GLP 28-day mouse toxicology study, SYNB1020 was safe and well tolerated. No toxicity was detected at the highest feasible dose, and there was no evidence of distribution of SYNB1020 outside the GI tract. Consequently, the no observed effect level was equal to the maximum feasible dose that could be administered, a threshold defined by volume limitations permitted in animals. This represents a greater than 1,000-fold safety margin over the starting dose planned in the Phase 1 study.

SYNB1020 Clinical Development Plan

Synlogic initiated a Phase 1, randomized, double-blinded, placebo-controlled study in June 2017 to evaluate the safety, tolerability, and gastrointestinal clearance of single and multiple doses of SYNB1020 in healthy volunteers. Synlogic expects approximately 50 subjects will be enrolled. The starting oral dose and subsequent range for dose escalation were selected based on the nonclinical toxicology and efficacy experiments and are expected to span the projected efficacious dose range in humans. The primary outcome measures will evaluate the safety and tolerability of SYNB1020 by assessing the nature and frequency of adverse events, laboratory assessments and electrocardiogram. Secondary measures will investigate the gastrointestinal tolerability and the kinetics of SYNB1020. In addition, blood, urine, and fecal samples will be collected and evaluated for exploratory biomarkers to gain mechanistic insights regarding ammonia consumption. If SYNB1020 appears

well tolerated and safe in healthy subjects, Synlogic plans to evaluate SYNB1020 for the management of hyperammonemic patients, such as UCD and HE.

SYNB1618 for PKU

PKU is a rare IEM caused by a genetic defect in the gene phenylalanine hydroxylase ("PAH") leading to phenylalanine ("Phe") accumulation in the blood and brain, where it is neurotoxic and can lead to neurological deficits and even death. Current disease management of PKU involves dietary protein restriction with the consumption of phenylalanine-free protein supplements. The only approved medication, Kuvan® (sapropterin dihydrochloride) is indicated for a subgroup of patients and does not eliminate the need for ongoing dietary management. Despite recommendations supporting life-long control of phenylalanine levels, compliance is challenging due to the highly restrictive nature of the diet, putting patients at risk for cognitive and psychiatric disease and supporting the need for novel treatment approaches.

Synlogic's Synthetic Biology platform is well-suited to complement the missing enzyme function in PKU patients by providing alternative metabolic pathways to consume Phe. Synlogic's second IEM program, SYNB1618 for PKU, is designed to remove excess phenylalanine from the blood by transforming it into non-toxic metabolites. SYNB1618 has demonstrated activity in a rodent model of PKU. Synlogic expects to initiate a Phase 1 clinical trial for SYNB1618 in the first half of 2018.

Overview of PKU

Phenylalanine is an essential amino acid that enters the body primarily through dietary protein, and can be toxic if not sufficiently broken down and eliminated. The metabolism of phenylalanine by the liver is dependent on adequate function of the liver enzyme PAH and the cofactor tetrahydrobiopterin ("BH4") necessary for its activity. When the PAH gene is mutated and/or the production of BH4 is blocked, phenylalanine cannot be sufficiently broken down and accumulates to toxic levels (i.e., hyperphenylalaninemia), which can cause irreversible brain damage. PKU is an inherited metabolic disease that presents as a severe form of hyperphenylalaninemia.

The disease course of PKU typically involves worsening neurological function that begins in infancy or early childhood. The clinical manifestations vary depending on severity of the enzyme mutation, the time of diagnosis and treatment initiation, and compliance. Symptoms may be extensive, such as severe mental retardation, or they may reflect more moderate neurocognitive or physical issues, such as below average intelligence, behavioral or mood disorders, memory loss, difficulty concentrating, decreased motor function, eczema, body odor, and tremors or seizures. A woman with PKU who becomes pregnant could develop maternal PKU if her diet is not strictly controlled, and there is a risk that the baby will be born with one or more birth defects such as mental retardation, microcephaly or congenital heart disease.

Based on the success of newborn screening efforts that began in developed countries in the 1960s, it is believed that nearly all PKU patients under the age of 40 have been diagnosed at birth. The National PKU Alliance estimates that in the United States there are currently 16,500 people living with PKU.

Currently, management of PKU requires a heavily modified diet that restricts protein intake, in order to minimize consumption, combined with essential amino acid and vitamin supplementation. Special medical foods, including phenylalanine-free protein formula, provide patients with dietary protein and fulfill other nutrient needs. However, it is challenging for most PKU patients, even with the efforts of supportive family and social networks, to adhere to the restricted diet to the level that provides the necessary control of phenylalanine levels. Patients often have trouble adhering to the diet from a young age, with particular challenges arising during times of increasing independence during adolescence. Furthermore, access to low protein foods can be challenging, as they are costlier and less nutritious than their higher protein, non-modified counterparts.

Kuvan® (sapropterin dihydrochloride) was the first drug approved for the treatment of PKU in 2007. It is indicated for the reduction of blood phenylalanine in patients with hyperphenylalaninemia with residual PAH activity as it is a synthetic form of the BH4 cofactor. Oral administration of Kuvan, along with protein restriction, has lowered phenylalanine levels in patients who have residual PAH activity and/or mild forms of the disease, which accounts for approximately 20-50% of the PKU population. However, Kuvan does not eliminate the need for ongoing dietary management in all patients . Large neutral amino acids have also demonstrated activity in blocking absorption of excess phenylalanine by the intestines and brain, but are currently only administered in adolescents and adults.

A pegylated form of recombinant phenylalanine ammonia lyase ("PAL"), called Pegvaliase, an enzyme that metabolizes phenylalanine but does not require cofactor activity, is in clinical development for PKU and is not yet approved. While Pegvaliase injections one to two times daily have been proven to lower phenylalanine levels regardless of whether patients are following a low protein diet or not, patients may experience injection site reactions and/or develop antibodies to the enzyme, which limits its effectiveness.

Despite recent improvements in PKU therapy, patients continue to suffer from poor outcomes. Even patients who are diagnosed and treated early have increased risk of neurocognitive abnormalities and psychiatric complications and are burdened by the life-long struggle to comply with strict dietary modifications. Available drug therapies demonstrate limited effectiveness. are accompanied by immunologic and other toxicities, and may still require patients to maintain a heavily restricted diet. Synlogic believes a truly transformative therapy would be orally-dosed and provide sustained, safe concentrations of phenylalanine while allowing for a normal or only moderately restricted diet. Synlogic believes that a Synthetic Biotic medicine could be an effective oral therapeutic that acts from the gut to transform excess phenylalanine with the consequent effect of reducing levels in the blood without the need for severe phenylalanine restriction or risk of systemic toxicities.

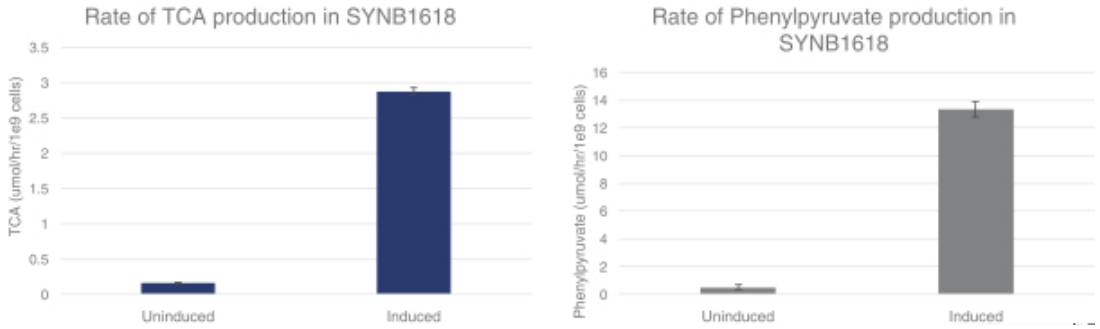
SYNB1618 Design

SYNB1618 is a genetically-modified strain of *E. coli* Nissle engineered to express a synthetic pathway for transporting and metabolizing phenylalanine in patients with PKU following oral administration. SYNB1618 was designed to overcome the missing enzyme function in patients with PKU with an alternative pathway to reduce phenylalanine levels.

In designing SNYB1618, Synlogic integrated genes encoding the phenylalanine transporter ("PheP"), PAL derived from *Photorhabdus luminescens* and L-amino acid deaminase ("LAAD") derived from the organism *Proteus mirabilis* into the *E. coli* Nissle genome. PheP transports phenylalanine into the Synthetic Biotic bacterial cell with high efficiency, while within the cell PAL converts phenylalanine to the non-toxic byproduct *trans*-cinnamate ("TCA"). The inclusion of multiple copies of these genes further enhanced activity. Similar to PAL, LAAD converts phenylalanine to a non-toxic byproduct, phenylpyruvate.

SYNB1618 Nonclinical Program

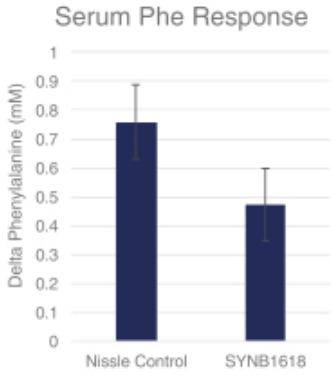
Synlogic has demonstrated that SYNB1618 can metabolize phenylalanine *in vitro* using both the PAL and LAAD enzymes by measuring their respective non-toxic byproducts. Synlogic compared the activity of SYNB1618 under conditions in which the Synthetic Biotic strain is induced (in the "ON" state) versus when uninduced when metabolic activity is suppressed. As shown in the graphs below, i*n vitro* activation of PAL led to an 18.5-fold increase in production of the TCA metabolite over uninduced levels, and *in vitro* activation of LAAD led to production of phenylpyruvate levels at 26.7-fold over uninduced levels.

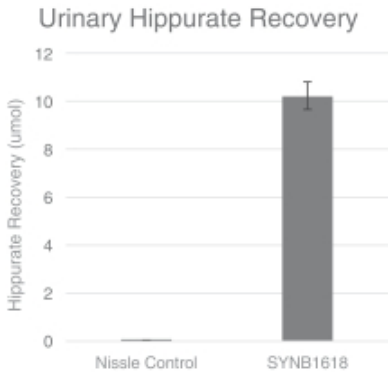


Pre-Clinical Efficacy Studies

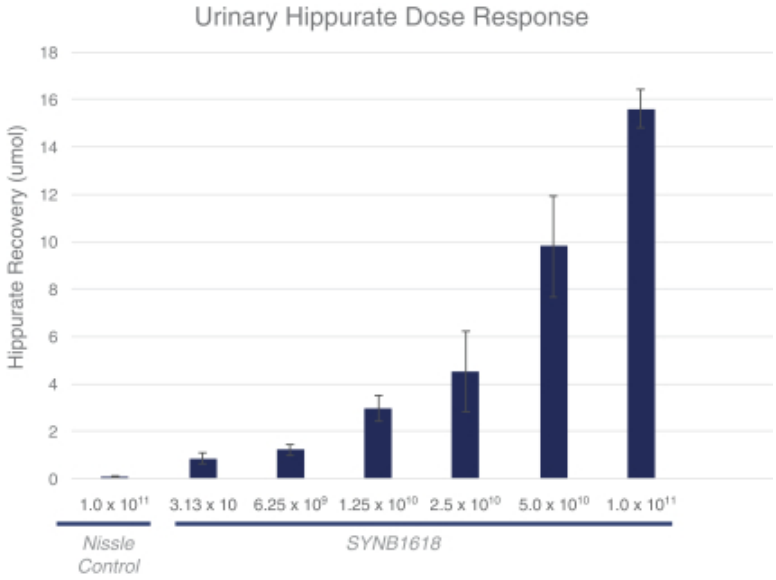
In vivo studies have focused on the *enu2-/-* mouse model that contains a mutation in the gene coding for phenylalanine hydroxylase, the same enzyme that is deficient in PKU patients. Mice with this genetic defect maintained on normal chow accumulate phenylalanine in their blood at concentrations greater than 2000 µM, which is similar to blood concentrations found in humans with PKU. On a phenylalanine-restricted diet, blood phenylalanine levels can be maintained at the healthier range of 100-200 µM. Subcutaneous injection of phenylalanine-restricted mice with phenylalanine (0.1 mg/g body weight) results in a rapid increase in blood phenylalanine concentrations. As shown in the graph below, this increase associated with this phenylalanine challenge was significantly blunted (as reported as the delta, or reduction, from peak phenylalanine levels) upon oral administration of SYNB1618, compared to administration of the non-engineered control strain that did not have the phenylalanine degradation pathway (39% blunting of serum phenylalanine, p = 0.0002).

To further support the development of SYNB1618, hippuric acid was followed as a urinary biomarker of phenylalanine degradation. One product of phenylalanine degradation by SYNB1618, TCA, is converted to hippurate by liver enzymes and excreted in the urine. Following treatment of *enu2-/-* mice with SYN1618, urinary hippurate concentration increased 270-fold compared to mice treated with unengineered *E. coli* Nissle controls. Taken together, these data show that SYNB1618 has activity in the GI tract, and that degradation of recirculating phenylalanine is effective in decreasing the levels found in blood, independent of dietary intake.





Synlogic has also demonstrated a dose response in the same animal model with its clinical candidate strain SYNB1618. With increasing oral doses of this single strain, Synlogic observes increasing levels of urinary hippurate in mice.



Moreover, in preliminary primate studies, administration of SYN1618 to cynomolgus monkeys following an oral high protein challenge resulted in elevated levels of urinary hippurate recovery compared to the protein challenge alone. These data indicate that SYN1618 is functional in the environment of the primate gut.

SYNB1618 Clinical Development Plan

Synlogic is currently conducting IND-enabling studies and scaling up manufacturing to support initiation of clinical studies of SYNB1618. Synlogic is planning a Phase 1, randomized, double-blinded, placebo-controlled study to evaluate the safety, tolerability, and gastrointestinal clearance of SYNB1618. In such study, healthy adult volunteers would be treated with single- or multiple-ascending doses of SYNB1618. Synlogic expects approximately 50 subjects will be enrolled.

Upon determination of the maximum tolerated dose, Synlogic expects an expansion cohort of up to 16 adult subjects with PKU will be treated. In addition to the primary endpoint of safety and tolerability, this study will evaluate the change from baseline in several pharmacodynamic parameters compared to placebo in order to characterize the kinetics of SYNB1618 in humans, and provide mechanistic and clinical insights regarding urinary hippurate production and phenylalanine reduction. Synlogic expects to initiate this Phase 1 trial in the first half of 2018.

Synthetic Biotic Medicines for Additional IEMs

Learnings from the design, pre-clinical research, clinical planning and scalable manufacturing of the lead programs have already informed development of future clinical candidates. Synlogic's initial programs were selected based on applicability of the Synthetic Biotic platform to provide pathway complementation in IEMs in which the toxic metabolite was known to be associated with the relevant clinical endpoint and to be accessible in the GI tract. Additional examples in which there is opportunity to expand the potential of Synthetic Biotic medicines include discovery-stage programs for (1) MSUD and IVA and (2) PA and MMA. These are rare metabolic deficiencies in which a toxic metabolite can accumulate and lead to neurological decline and death. There is no approved therapy for either disease and these patients are managed with dietary modifications, supportive care, and liver transplant when available.

A Synthetic Biotic Program for Maple Syrup Urine Disease and Isovaleric Acidemia

MSUD is an IEM that was first described in the 1950s as an inherited progressive neurological degenerative disorder. Patients with this disease have mutations in one of the protein subunits of the mitochondrial multi-enzyme complex called branched-chain alpha-ketoacid dehydrogenase. These mutations cause the patients to accumulate high levels of the branched chain amino acids ("BCAA") leucine, isoleucine or valine that are neurotoxic and cause severe neurological pathologies characterized by brain edema, seizure, spasticity and respiratory irregularities that can lead to death. The MSUD name derives from the strong maple syrup odor in the urine of these patients. Similarly, IVA can result from a genetic defect leading to leucine accumulation. It is difficult to estimate the prevalence of these rare indications given few longitudinal studies. Based on estimates of the live birth rate of MSUD of 1:185,000 and IVA of 1:250,000, respectively, and applying assumptions to account for mortality and survival rates, it is estimated that there may be approximately 2,500 MSUD or IVA patients in the United States.

Currently-available treatments for disorders involving the catabolism of BCAA are inadequate for the long-term management of the disorders and have severe limitations. A low protein/BCAA-restricted diet, with micronutrient and vitamin supplementation as necessary, is the widely-accepted long-term disease management strategy. However, BCAA-intake restrictions can be problematic since these amino acids are also essential nutrients that can only be acquired through diet and are necessary for metabolic activities such as protein synthesis. Even with proper monitoring and patient compliance, branched chain amino acid dietary restrictions result in a high incidence of mental retardation and mortality. MSUD is cured by liver transplantation; however, limited availability of donor organs, costs, and the need to rely on life-long immunosuppressant therapy are limiting. Therefore, there is significant unmet need for an effective, reliable, and/or long-term treatment for disorders involving the catabolism of branched chain amino acids.

Synlogic has built a Synthetic Biotic discovery program to modulate the expression of two BCAA transporters and three BCAA-degrading enzymes. Results *in vitro* demonstrate the efficient degradation of

BCAAs into non-toxic branched-chain alcohols that can then be further metabolized and eliminated from the body. In preliminary studies in a mouse model of MSUD, the oral delivery of the Synthetic Biotic strain suppresses the increase in blood BCAA levels induced by a high-protein diet and prevents the associated waning, or moribund, phenotype as measured by improved locomotor activity. Based on the *in vivo* therapeutic effects observed, Synlogic continues to improve this approach as a potential promising therapy for MSUD and IVA patients.

Synlogic's Synthetic Biotic Program for Propionic Acidemia and Methylmalonic Acidemia

Organic acidemias are a group of rare IEMs in which amino acid metabolism is disrupted, causing an accumulation of toxins. Normally, the human body converts certain amino acids, such as isoleucine, valine, threonine, and methionine, into a derivative of propionic acid to create energy. Patients with PA and MMA have enzyme deficiencies caused by mutations in the pathway for propionate catabolism that lead to the toxic accumulation of propionic acid or methylmalonic acid-related metabolites in the blood stream, leading to damage of the brain, heart, and liver. Clinical manifestations of the disease vary depending on the degree of enzyme deficiency and include seizures, vomiting, lethargy, hypotonia, encephalopathy, developmental delay, failure to thrive, and secondary hyperammonemia. It is difficult to estimate the prevalence of these indications given few longitudinal studies. The live birth rates are estimated as 1:105,000-1:130,000 for PA and 1:50,000-100,000 for MMA. Applying assumptions to account for mortality and survival rates, it is estimated that there may be 2,000-3,000 PA or MMA patients in the United States.

Currently available treatments for disorders involving propionate catabolism are inadequate and have severe limitations. Patients may present acutely at birth with metabolic acidosis and hyperammonemia, or later in life with more heterogeneous clinical symptoms, and run the risk of early death or severe neurologic damage. Mental outcomes tend to be worse in PA, and patients who can also experience late complications like cardiomyopathy. Late complications for MMA patients include chronic kidney disease. Except for MMA patients who are responsive to vitamin B12, there is significant unmet need for effective, reliable and/or long-term treatment for disorders involving the catabolism of propionate.

Propionate is produced naturally in the gut by bacterial metabolism, and therefore a Synthetic Biotic medicine that consumes propionate in that environment could be an attractive approach to treating these disorders. Synlogic has constructed two discovery-stage Synthetic Biotic strains that have each demonstrated degradation of propionate into non-toxic metabolites *in vitro*. In a preliminary experiment in a mouse model of propionic acidemia, the oral delivery of both Synthetic Biotic strains independently suppressed the plasma concentration of disease-related toxic metabolites. Synlogic is planning to continue assessing these strains in animal models and improving them as potential promising therapies for PA and MMA patients.

Synthetic Biotic Medicines for Broader Metabolic Disease

Synlogic's Synthetic Biotic platform combined with its product discovery and development capabilities drive the potential for multiple clinically meaningful opportunities for patients affected by a broad set of metabolic diseases such as Nonalcoholic Steatohepatitis ("NASH"). For these indications, there is need for a safe, oral therapy with local activity in the gut to reset a metabolic dysfunction. Synlogic's approach is amenable to enabling combination therapy, which is increasingly recognized as a necessary component of effective treatment. Synlogic continues to explore strategic partnerships that would leverage the complementary capabilities of partners in order to develop Synthetic Biotic medicines for these broader groups of patients in need.

Synthetic Biotic Medicines for Immunomodulation

Synlogic's Synthetic Biotic platform has the potential to generate clinically meaningful therapies for patients affected by immune-mediated diseases. Among these conditions, IBD is particularly attractive, as it

allows Synlogic to leverage knowledge and expertise gleaned from Synlogic's metabolic programs to develop living medicines that can act locally at the site of disease in the gut. Because Synlogic's approach is based on local delivery to the site of inflammation and not on systemic administration, Synlogic anticipates that its Synthetic Biotic medicines may offer an attractive safety profile in this setting. In 2015, Synlogic entered into a multi-year global collaboration with AbbVie focused on the discovery and development of a Synthetic Biotic medicines for the treatment of IBD.

Synlogic's Synthetic Biotic Medicines for Inflammatory Bowel Disease

IBD is a group of diseases characterized by significant local inflammation in the GI tract typically driven by T cells, activated macrophages and compromised function of the epithelial barrier. IBD pathogenesis is linked to both genetic and environmental factors and may be caused by altered interactions between gut microbes and the intestinal immune system. Current approaches to treat IBD are focused on therapeutics that modulate the immune system and suppress inflammation. These therapies include steroids, such as prednisone, and tumor necrosis factor inhibitors, such as Humira®. Drawbacks from these approaches are associated with systemic immunosuppression, which includes greater susceptibility to infectious diseases and cancer. It is estimated that between 1.0-1.3M patients have IBD in the United States.

Compromised gut barrier function also plays a central role in autoimmune diseases pathogenesis. A single layer of epithelial cells separates the luminal contents of the gut from the host circulatory system and the immune cells in the body. Disrupting the epithelial layer can lead to pathological exposure of foreign antigens from the lumen resulting in increased susceptibility to autoimmune disorders. The interplay between the gut microbiota and the host is thought to play key roles in both the maintenance of the epithelial barrier as well as homeostatic immunity. Thus, enhancing barrier function and reducing inflammation in the gastrointestinal tract are potential therapeutic mechanisms for the treatment or prevention of autoimmune disorders. Synlogic's Synthetic Biotic platform allows for the effective programming of *E. coli* Nissle to execute these functions, including the metabolic production of factors such short chain fatty acids to enhance barrier function and secreting proteins, such as immunomodulatory cytokines.

Synlogic's Synthetic Biotic Medicines for Immuno-Oncology

Synlogic believes boosting the body's immune response against tumor cells is one of the most promising advances in the treatment of cancer. The so-called "hot tumors", those with robust immune cell infiltration, specifically by T cells, respond well to immunotherapies such as the PD-1 and CTLA-4 checkpoint inhibitors. Checkpoint inhibitors work by blocking pathways that inhibit T cells thus enabling them to recognize and destroy the tumor. Checkpoint inhibitors have significantly extended the lives of patients with several cancer types and, in some cases, have resulted in complete clinical responses. However, a large proportion of tumors are "cold" (i.e., they lack T cells), and respond poorly to immunotherapy.

Synlogic's goal is to leverage its Synthetic Biotic platform to design living medicines that can modify the tumor microenvironment to convert "cold" tumors into "hot." Synlogic believes that this transition will dramatically expand the patient population amenable to clinical benefit by immunotherapy. Synlogic's approach is designed to deliver robust therapeutic combinations to the tumors, without significant systemic exposure. Synthetic Biotic medicines are being developed to be administered by an intra-tumor injection or, in the case of GI cancers, by oral administration and can be engineered to perform three types of functions: metabolic conversions, secretions of proteins or bacterial surface display of specific single chain antibody domains, known as scFvs.

Synlogic's Synthetic Biotic platform allows it to approach "cold" tumors in a rational, mechanistic way, and can deliver multiple validated mechanisms to elicit specific immune responses in the tumor microenvironment. Synlogic's main mechanistic areas of focus in the context of tumor immunology include:

- *Immune activation and priming:* Synlogic's bacterial Synthetic Biotic chassis is predicted to engage innate immune cells in the tumor microenvironment, thereby initiating an immune cascade to activate

and direct T cells to the tumor. Lack of effective presentation of tumor-specific antigens to T cells is recognized as a significant limitation to the initiation of immune responses in tumors. Synlogic is building and optimizing Synthetic Biotics medicines with the potential of addressing this issue.

- *Immune augmentation/Reversal of immunosuppression:* Synlogic has developed strains that actively consume and transform immunosuppressive metabolites in the tumor microenvironment, with the goal of setting up a milieu conducive to immune activation and tumor destruction.
- *T cell expansion:* Tumor antigen-specific T cell expansion and prevention of exhaustion are recognized as key objectives for successful cancer immunotherapy. Synlogic is developing Synthetic Biotic medicines programs to secrete specific cytokines to promote T cell survival and expansion.
- *Stromal modulation:* The physical structure of tumors is receiving increasing attention as emerging data demonstrate its importance in orchestrating tumor growth, immune evasion and resistance to chemotherapy, such as in pancreatic ductal adenocarcinoma. Tumor-derived extracellular matrix proteins can limit the perfusion of drugs or antibodies, contributing to the remarkable resistance of this tumor type to therapy. Synlogic has developed strains that secrete active enzymes with the capacity to remodel extracellular matrix proteins to make the tumor more permeable.

Synlogic's product vision for immuno-oncology is to use a rational approach to selecting and combining relevant mechanisms of action for the microenvironment of specific tumor types. Synlogic will focus on tumor types with high unmet medical need, including colorectal and hepatocellular carcinomas, pancreatic cancer and melanomas refractory to current immunotherapies. Currently three programs are in the early pipeline and are diversified in terms of indication, combinations of mechanisms, and route of administration.

Collaboration Agreements

To accelerate the development and commercialization of Synthetic Biotic medicines to patients in therapeutic areas outside of IEMs, Synlogic has formed, and intends to seek other opportunities to form, strategic alliances with collaborators that can expand Synlogic's pipeline of therapeutic development and product candidates. Synlogic also works, and intends to seek additional opportunities to work, with multiple academic, research and translational medicine organizations and entities to deepen its understanding and development of living medicines with the potential to treat disease and disorders.

AbbVie

In July 2015, Synlogic entered into a license agreement with its subsidiary Synlogic IBDCo, Inc. ("IBDCo") and an Agreement and Plan of Merger with AbbVie (together, the "AbbVie Agreements") to collaborate on the discovery and development of Synthetic Biotic medicines for the treatment of IBD. The AbbVie Agreements provide AbbVie with an exclusive option to acquire IBDCo, which would then have an exclusive worldwide license to develop and commercialize up to three specified Synthetic Biotic medicines for the treatment of IBD.

Under the terms of the collaboration with AbbVie, Synlogic has the responsibility to discover, characterize and optimize one lead Synthetic Biotic product candidate to the point of a IND-enabling package, together with two backup product candidates, through a research and development program covering a limited number of effectors that modulate the IBD pathophysiology. The multi-year collaboration combines AbbVie's expertise in inflammatory diseases with Synlogic's expertise in synthetic biology and metabolic engineering. AbbVie agreed to pay IBDCo an upfront payment of $2.0 million, received in December 2015, and up to $16.5 million upon the achievement of certain research and development milestones. In May 2017, IBDCo achieved one of these research and development milestones under the AbbVie Agreement for which it will receive $2.0 million.

If AbbVie accepts Synlogic's IND-enabling package covering the lead Synthetic Biotic product candidate, AbbVie may exercise its exclusive option to acquire IBDCo, which would house the lead and two backup

product candidates. If this option is exercised, AbbVie would pay Synlogic an option exercise fee upon the closing of the IBDCo merger and Synlogic would be eligible to receive future development, regulatory and commercial milestone payments, and low single digit royalties on sales of the Synthetic Biotic medicines. In addition, AbbVie would then assume full control of all further clinical development and commercial activity, including responsibility for all expenses and decisions.

Potential Future Collaborations

Synlogic views strategic partnerships as important drivers for helping accelerate its goal of effectively treating patients, and Synlogic will continue to seek strategic alliances with collaborators who can help fund, develop and commercialize its novel therapeutic development and product candidates, particularly in large metabolic indications and immune-oncology. As the potential application of its Synthetic Biotics platform is extremely broad, Synlogic also plans to continue to identify academic, research and translational medicine organizations and entities that can contribute expertise and resources to its programs, to allow it to more rapidly expand Synlogic's impact to broader patient populations.

Intellectual Property

Synlogic strives to protect and enhance the proprietary technology, inventions, and improvements that are commercially important to its business, including seeking, maintaining, and defending patent rights, whether developed internally or licensed from Synlogic's collaborators or other third parties. Synlogic's policy is to seek to protect Synlogic's proprietary position by, among other methods, filing patent applications in the United States and in jurisdictions outside of the United States related to Synlogic's proprietary technology, inventions, improvements, and product candidates that are important to the development and implementation of Synlogic's business. Synlogic also relies on trade secrets and know-how relating to its proprietary technology and product candidates, continuing innovation, and in-licensing opportunities to develop, strengthen, and maintain its proprietary position in the field of synthetic biology. Synlogic additionally relies on data exclusivity, market exclusivity, and patent term extensions when available, and plans to seek and rely on regulatory protection afforded through orphan drug designations. Synlogic's commercial success may depend in part on its ability to obtain and maintain patent and other proprietary protection for its technology, inventions, and improvements; to preserve the confidentiality of its trade secrets; to maintain Synlogic's licenses to use intellectual property owned by third parties; to defend and enforce Synlogic's proprietary rights, including its patents; and to operate without infringing on the valid and enforceable patents and other proprietary rights of third parties.

Synlogic believes it is well positioned in terms of intellectual property because Synlogic:

- has built and expanded, and intends to continue expansion in, a broad worldwide portfolio of intellectual property, including patents and patent applications, in areas relevant to the development, manufacturing and formulation of human therapeutic products using live biotherapeutics based on synthetic biology;
- intends to take additional steps, where appropriate, to further protect Synlogic's intellectual property rights, including, for example, through the use of copyright and trademark protection, as well as regulatory protection available via orphan drug designations, data exclusivity, market exclusivity and patent term extensions.

Synlogic believes its intellectual property portfolio provides broad coverage of its Synthetic Biotic platform and applicable disease-related technologies, which are directed to diseases and conditions associated with hyperammonemia, hyperphenylalanemia, other IEMs and acquired metabolic disorders, autoimmune and other inflammatory disorders and oncology. As of June 2017, Synlogic's intellectual property portfolio consists of 193 Synlogic-owned and in-licensed patents and patent applications in U.S. and foreign jurisdictions, including 11 issued patents.

Disease-related applications.

The disease-related applications in Synlogic's intellectual property portfolio relate to certain pathological conditions and provide coverage for engineered bacteria having genetic circuitry designed to specifically address those conditions and the associated disease states. Disease related applications relate to pathological conditions and include:

Hyperammonemia

- Synlogic's lead program addresses conditions associated with hyperammonemia, for which it has developed engineered bacterial strains containing genetic circuitry specifically designed to metabolize ammonia.
- The intellectual property portfolio provides robust coverage for compositions directed to engineered bacterial strains, methods of making the bacterial strains and methods for treating diseases that involve accumulation of ammonia (e.g., UCD, HE). Synlogic's intellectual property provides coverage for the lead product candidate SYNB1020 and methods of its manufacture and use. In addition to UCD, SYNB1020 could be useful for the treatment of hyperammonemia in HE patients with cirrhosis of the liver, which indication is also covered by Synlogic's intellectual property.
- Currently, intellectual property relating to this technology includes ten pending applications in U.S. and foreign jurisdictions, as well as one issued and one allowed U.S. patent directed to composition of matter and pharmaceutical composition claims covering Synlogic's clinical candidate. The patent term for this IP will expire in December 2035, excluding any patent term adjustments or extensions.

Hyperphenylalanemia

- Synlogic's program addresses conditions associated with hyperphenylalanemia, for which it has developed engineered bacterial strains containing genetic circuitry specifically designed to metabolize phenylalanine.
- Synlogic's intellectual property portfolio provides coverage for compositions directed to engineered bacterial strains, methods of making the bacterial strains and methods for treating diseases that involve accumulation of phenylalanine. Synlogic's intellectual property provides coverage for the lead product candidate SYNB1618 and methods of its manufacture and use.
- Currently, intellectual property relating to this technology includes three pending U.S. patent applications and two international patent applications directed to composition of matter and pharmaceutical compositions covering Synlogic's lead product candidate. The patent term for this intellectual property will expire in May 2036, excluding any patent term adjustments or extensions.

Other Inborn Errors of Metabolism

- Additional disease-related intellectual property includes patent applications directed to Synlogic's Synthetic Biotic technology for use in treating diseases and conditions arising from IEMs.
- Synlogic's intellectual property provides coverage of compositions of engineered bacteria, methods of making the bacterial strains and methods of treating diseases associated with accumulation of BCAA (e.g., leucine, isoleucine and valine), including MSUD. Synlogic currently has one U.S. application and one PCT application directed to diseases involving accumulation of BCAA. The patent term for this intellectual property will expire in June 2036, excluding any patent term adjustments or extensions.
- Additional Synlogic intellectual property covers compositions of engineered bacteria, methods of making the bacterial strains and methods of treating organic acidemias, including those associated with accumulation of propionic acid and related toxic metabolites, such as PA and MMA. Synlogic

currently has one U.S. application and one PCT application directed to diseases involving accumulation of organic acid metabolites. The patent term for this intellectual property will expire in July 2036, excluding any patent term adjustments or extensions.

Metabolic Disorders

- In addition to IEMs, other disease-related intellectual property includes patent applications directed to Synlogic's Synthetic Biotic technology for use in treating diseases and conditions associated with acquired metabolic disorders, including, but not limited to NASH.
- Synlogic's intellectual property provides broad coverage of compositions of engineered bacteria, methods of making the bacterial strains and methods of treating various metabolic diseases. Synlogic's current intellectual property consists of two PCT applications relating to this technology. The patent term for this intellectual property has expiration dates ranging from June 2036 to December 2036, excluding any patent term adjustments or extensions.

Inflammatory and Autoimmune Diseases

- Additional disease-related intellectual property includes numerous patent applications directed to Synlogic's Synthetic Biotic technology for use in treating diseases and conditions associated with an inflammatory state, including, but not limited to, diseases associated with gut inflammation, compromised gut mucosal barrier (leaky gut), and various autoimmune disorders.
- Synlogic's intellectual property provides broad coverage of compositions of engineered bacteria, methods of making the bacterial strains and methods of treating diseases associated with gut inflammation, leaky gut, and autoimmune disorders, such as Inflammatory Bowel Disease, including Crohn's Disease, ulcerative colitis, and other diseases. Synlogic's current intellectual property consists of three U.S. applications and three PCT applications relating to this technology, which is being developed in collaboration with AbbVie and which intellectual property is Synlogic-owned. The patent term for this intellectual property has expiration dates ranging from December 2035 to March 2036, excluding any patent term adjustments or extensions. In addition, Synlogic has one PCT application relating to this technology which is jointly owned by Synlogic and MIT, which expires in December 2035, excluding any patent term adjustments or extensions.

Immuno-Oncology

- In addition, Synlogic has disease-related intellectual property directed to its Synthetic Biotic technology for use in immuno-oncology, which intellectual property covers bacterial strains engineered to metabolize and/or produce biomolecules that modify the tumor microenvironment and immune response, resulting in an array of mechanistic functions, including immune activation and priming, immune augmentation and/or reversal of immunosuppression, T-cell expansion, and tumor stromal modulation.
- Synlogic's intellectual property provides broad coverage of compositions of engineered bacteria, methods of making the bacterial strains and methods of treating various cancers. Synlogic's current intellectual property consists of two PCT applications with expiration dates ranging from January 2037 to February 2037, excluding any patent term adjustments or extensions.

Platform Technology Applications.

In addition to the disease-related technology, Synlogic's intellectual property portfolio also includes applications directed to platform technologies developed internally by Synlogic. Exemplary platform technologies include bacterial chassis-related and genetic circuitry-related technological developments,

including, for example, improvements in inducible gene regulation, control of bacterial cell growth, including auto-regulation thereof, and systems for importing metabolites, as well as secreting therapeutic effectors. These platform technologies, and Synlogic's intellectual property coverage thereof, are broadly applicable to Synlogic's therapeutic Synthetic Biotic medicines.

In addition to Synlogic's own patent applications, Synlogic has licensed patents and patent applications from MIT and Trustees of Boston University ("BU") to access intellectual property covering synthetic biology circuitry that Synlogic is exploring and developing. The intellectual property licensed from MIT and BU relates to genetic circuitry (designed to be modular components for integration into biological systems), cells containing the genetic circuitry, and methods and systems for gene regulation using the genetic circuitry.

The intellectual property licensed from MIT includes applications related to genome editing systems used to target specific genes for recombination and methods for delivering a gene editing system to endogenous bacteria. It also includes applications directed to genetic circuits and biological systems for regulating gene expression using various recombinase-based and other promoter systems, including promoter systems that respond to different levels of an input signal. The MIT intellectual property also covers methods for identifying mutant promoters that have an altered level of response to an input signal and methods of controlling gene expression in certain bacteria. In addition, the MIT intellectual property includes a PCT application jointly owned by Synlogic and MIT, directed to engineered bacteria and methods for treating inflammatory bowel disease. The licensed patents and applications from the MIT have expiration dates ranging from 2033 to 2037, excluding any patent term adjustments or extensions.

The intellectual property licensed from BU includes patents and applications relates to genetic circuitry and biological systems for controlling gene expression employing the genetic circuits, detecting the production of a target gene product, and delivering genetic circuits to endogenous bacteria. The various genetic circuits are designed to respond to external cues and also designed to tighten control of gene expression regulated by inducible and constitutive promoter systems using a variety of genetic components, for example, sensors, inducers, repressors, antisense, stem-loop sequences, recombinases, RNAi, inverted sequences, and ribosome-binding site sequences, to generate various promoter toggle switches, adjustable threshold switches, and oscillator switches, among others. In addition, the BU intellectual property covers biocontainment systems that couple environmental sensing with circuit-based control of cell viability. The licensed patents and applications from BU have expiration dates ranging from 2019 to 2036, excluding any patent term adjustments or extensions.

Massachusetts Institute of Technology ("MIT") License

Synlogic entered into a license agreement with MIT, effective November 2015 and amended as of July 2016. Under this license agreement, MIT granted Synlogic a worldwide license under certain patents and patent applications that is exclusive in the therapeutics and theranostics fields and non-exclusive in the internal research field. The license grants Synlogic rights to develop, make, have made, use, import, sell, and offer to sell licensed products and processes. Synlogic does not have the right to control prosecution of these licensed patents and patent applications and its rights to enforce the in-licensed patent rights are subject to certain limitations.

Under the terms of the MIT license agreement, as consideration for the license, Synlogic paid to MIT an upfront license fee and is eligible to receive an annual maintenance fee, milestone fees , sublicense fees if Synlogic should ever grant a sublicense to the licensed patents or patent applications and low single-digit royalty percentages on net sales of licensed products. MIT also receives reimbursement from Synlogic for patent prosecution expenses. Synlogic is subject to diligence requirements to develop licensed products in accordance with certain development milestones.

BU and MIT License

Synlogic entered into a license agreement with BU and MIT effective October 2015 and signed April 2017. Howard Hughes Medical Institute ("HHMI") has an ownership interest in certain patent rights licensed to

Synlogic under this license, which interest HHMI assigned to BU. HHMI is not a party to the license agreement, but receives the benefit of certain terms. Under this license agreement, BU and MIT granted Synlogic a worldwide license under certain patents and patent applications that is exclusive in the therapeutics and theranostics fields and non-exclusive in the diagnostic and internal research field. The license grants Synlogic rights to make, have made, use, lease, import, sell, and offer to sell licensed products and processes. Synlogic does not have the right to control prosecution of the licensed patents and patent applications, and Synlogic's rights to enforce the licensed patent rights are subject to certain limitations. Under the terms of this license agreement, as partial consideration for the license, BU, MIT and MIT's agent Omega Cambridge SPV, L.P. were issued an aggregate of 325,377 shares of Synlogic Common Stock. In addition, Synlogic paid an upfront fee, and reimbursed past patent prosecution costs, and the licensors are eligible to receive from Synlogic an annual maintenance fee, milestone fees, sublicense fees if Synlogic should ever grant a sublicense to the licensed patents and patent applications and low single-digit royalty percentages on net sales of licensed products. BU also receives reimbursement from Synlogic for patent prosecution expenses. Synlogic is subject to diligence requirements to develop licensed products in accordance with certain development milestones.

Individual patents extend for varying periods of time, depending upon the date of filing of the patent application, the date of patent issuance, and the legal term of patents in the countries in which they are obtained. Generally, patents issued for applications filed in the United States are effective for 20 years from the earliest effective non-provisional filing date. In addition, in certain instances, a patent term can be extended to account for delays in prosecution at the U.S. Patent and Trademark Office and/or to recapture a portion of the term effectively lost as a result of the FDA regulatory review period. For regulatory delays, the restoration period cannot be longer than five years and the total patent term, including the restoration period, must not exceed 14 years following FDA approval. The duration of patents outside of the United States varies in accordance with provisions of applicable local law, but typically is also 20 years from the earliest effective non-provisional filing date. However, the actual protection afforded by a patent varies on a product-by-product basis, from country-to-country, and depends upon many factors, including the type of patent, the scope of its coverage, the availability of regulatory-related extensions, the availability of legal remedies in a particular country, and the validity and enforceability of the patent.

The patent positions of companies like Synlogic are generally uncertain and involve complex legal and factual questions. No consistent policy regarding the scope of claims allowable in patents in the field of synthetic biology has emerged in the United States. The patent situation outside of the United States is even more uncertain. With respect to both licensed and company-owned intellectual property, Synlogic cannot be sure that patents will be granted with respect to any of Synlogic's pending patent applications or with respect to any patent applications filed by it in the future, nor can Synlogic be sure that any of its existing patents or any patents that may be granted to in the future will be commercially useful in protecting Synlogic's products and the methods used to manufacture those products. For additional risks, please see the section entitled "*Risk Factors—Risks Related to Intellectual Property*" in this proxy statement/prospectus/information statement.

Trademarks

Synlogic's registered trademark portfolio currently contains 31 registered trademark applications, consisting of seven (7) pending trademark applications in the United States and 24 pending trademark applications in Australia, Canada, China, Europe, India, Japan, Mexico and New Zealand and under the Madrid Protocol. Synlogic may also rely, in some circumstances, on trade secrets to protect its technology.

Other

Generally, Synlogic seeks to protect its technology and product candidates, in part, by entering into confidentiality agreements with those who have access to Synlogic's confidential information, including employees, contractors, consultants, collaborators, and advisors. In some circumstances, Synlogic may rely on trade secrets to protect its technology. Synlogic seeks to preserve the integrity and confidentiality of its

proprietary technology, trade secrets and processes by maintaining physical security of Synlogic's premises and physical and electronic security of its information technology systems. Although Synlogic has confidence in these individuals, organizations, and systems, agreements or security measures may be breached and Synlogic may not have adequate remedies for any breach. In addition, Synlogic's trade secrets may otherwise become known or may be independently discovered by competitors. To the extent that company employees, contractors, consultants, collaborators, and advisors use intellectual property owned by others in their work for Synlogic, disputes may arise as to the rights in related or resulting know-how and inventions. For this and more comprehensive risks related to Synlogic's proprietary technology, inventions, improvements and products, please see the section entitled "*Risk Factors—Risks Related to Intellectual Property,*" in this proxy statement/prospectus/information statement.

Regulatory Matters

Government Regulation and Product Approval

Government authorities in the United States, at the federal, state and local level, and other countries extensively regulate, among other things, the research, development, testing, manufacture, quality control, approval, labeling, packaging, storage, record keeping, promotion, advertising, distribution, marketing and export and import of products such as those Synlogic is developing. A new drug must be approved by the FDA through the NDA process and a new biologic must be approved by the FDA through the biologics license application ("BLA"), process before it may be legally marketed in the United States

U.S. Drug Development Process

In the United States, the FDA regulates drugs under the federal Food, Drug and Cosmetic Act ("FDCA") and in the case of biologics, also under the Public Health Service Act ("PHSA"), and implementing regulations. Synlogic's product candidates will be regulated by the FDA as biologics. The process of obtaining regulatory approvals and the subsequent compliance with applicable federal, state, local, and foreign statutes and regulations require the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or after approval, may subject an applicant to administrative or judicial sanctions. These sanctions could include the FDA's refusal to approve pending applications, withdrawal of an approval, a clinical hold, warning letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement, or civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on Synlogic. The process required by the FDA before a drug or biologic may be marketed in the United States generally involves the following:

- completion of pre-clinical laboratory tests, animal studies and formulation studies according to cGLP other applicable regulations;
- submission to the FDA of an IND which must become effective before human clinical trials may begin;
- performance of adequate and well controlled human clinical trials according to cGCP to establish the safety and efficacy of the proposed drug for its intended use;
- development and approval of a companion diagnostic device if the FDA or the sponsor believes that its use is essential for the safe and effective use of a corresponding product;
- submission to the FDA of a BLA;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the drug is produced to assess compliance with cGMP to assure that the facilities, methods and controls are adequate to preserve the drug's identity, strength, quality and purity; and
- FDA review and approval of the BLA.

Once a pharmaceutical candidate is identified for development, it enters the pre-clinical testing stage. Pre-clinical tests include laboratory evaluations of product chemistry, toxicity and formulation, as well as animal studies. An IND sponsor must submit the results of the pre-clinical tests, together with manufacturing information and analytical data, to the FDA as part of the IND. In June 2016, the FDA issued an updated guidance for the industry entitled "Early Clinical Trials with Live Biotherapeutic Products: Chemistry, Manufacturing and Control Information," which included recommendations from the FDA regarding the chemistry, manufacturing and control information that should be included in an IND for early clinical trials with live biotheraeutic products. Guidances such as this one reflect the FDA's thinking on a topic at the time that they are issued and although this guidance is not binding on the FDA or a sponsor, it provided Synlogic with additional information about what should be included in Synlogic's IND. The sponsor will also include a protocol detailing, among other things, the objectives of the first phase of the clinical trial, the parameters to be used in monitoring safety, and the effectiveness criteria to be evaluated, if the first phase lends itself to an efficacy evaluation. Some pre-clinical testing may continue even after the IND is submitted. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA, within the 30-day time period, places the clinical trial on a clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. Clinical holds also may be imposed by the FDA at any time before or during clinical trials due to safety concerns about on-going or proposed clinical trials or non-compliance with specific FDA requirements, and the trials may not begin or continue until the FDA notifies the sponsor that the hold has been lifted.

All clinical trials must be conducted under the supervision of one or more qualified investigators in accordance with cGCP regulations. They must be conducted under protocols detailing the objectives of the trial, dosing procedures, subject selection and exclusion criteria and the safety and effectiveness criteria to be evaluated. Each protocol must be submitted to the FDA as part of the IND, and timely safety reports must be submitted to the FDA and the investigators for serious and unexpected adverse events. An institutional review board ("IRB") at each institution participating in the clinical trial must review and approve each protocol before a clinical trial commences at that institution and must also approve the information regarding the trial and the consent form that must be provided to each trial subject or his or her legal representative, monitor the study until completed and otherwise comply with IRB regulations.

Human clinical trials are typically conducted in three sequential phases that may overlap or be combined:

- Phase 1: The product candidate is initially introduced into healthy human subjects and tested for safety, dosage tolerance, absorption, metabolism, distribution and excretion. In the case of some products for severe or life-threatening diseases, such as cancer, especially when the product may be too inherently toxic to ethically administer to healthy volunteers, the initial human testing is often conducted in patients.
- Phase 2: This phase involves clinical trials in a limited patient population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance and optimal dosage.
- Phase 3: Clinical trials are undertaken to further evaluate dosage, clinical efficacy and safety in an expanded patient population at geographically dispersed clinical study sites. These clinical trials are intended to establish the overall risk benefit ratio of the product candidate and provide, if appropriate, an adequate basis for product labeling.

Post-approval trials, sometimes referred to as Phase 4, may be conducted after initial marketing approval. These trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication. In certain instances, the FDA may mandate the performance of Phase 4 clinical trials as a condition of approval of a BLA.

The FDA or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend

or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug has been associated with unexpected serious harm to patients. Additionally, some clinical trials are overseen by an independent group of qualified experts organized by the sponsor, known as a data safety monitoring board or committee. Depending on its charter, this group may determine whether a trial may move forward at designated check points based on access to certain data from the trial. Phase 1, Phase 2, and Phase 3 testing may not be completed successfully within any specified period, if at all.

During the development of a new drug, sponsors are given opportunities to meet with the FDA at certain points. These points may be prior to submission of an IND, at the end of Phase 2, and before a BLA is submitted. Meetings at other times may be requested. These meetings can provide an opportunity for the sponsor to share information about the data gathered to date, for the FDA to provide advice, and for the sponsor and FDA to reach agreement on the next phase of development. Sponsors typically use the end of Phase 2 meeting to discuss their Phase II clinical results and present their plans for the pivotal Phase 3 clinical trial that they believe will support approval of the new drug. If this type of discussion occurs, a sponsor may be able to request a Special Protocol Assessment ("SPA"), the purpose of which is to reach agreement with the FDA on the design of the Phase 3 clinical trial protocol design and analysis that will form the primary basis of an efficacy claim.

According to FDA guidance for industry on the SPA process, a sponsor that meets the prerequisites may make a specific request for a special protocol assessment and provide information regarding the design and size of the proposed clinical trial. The FDA is required to evaluate the protocol within 45 days of the request to assess whether the proposed trial is adequate, and that evaluation may result in discussions and a request for additional information. An SPA request must be made before the proposed trial begins, and all open issues must be resolved before the trial begins. If a written agreement is reached, it will be documented and made part of the record. The agreement will be binding on the FDA and may not be changed by the sponsor or the FDA after the trial begins except with the written agreement of the sponsor and the FDA or if the FDA determines that a substantial scientific issue essential to determining the safety or efficacy of the drug was identified after the testing began. If the sponsor makes any unilateral changes to the approved protocol, the agreement will be invalidated.

Concurrent with clinical trials, companies usually complete additional animal studies and must also develop additional information about the chemistry and physical characteristics of the drug and finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things the manufacturer must develop methods for testing the identity, strength, quality and purity of the final drug. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the product candidate does not undergo unacceptable deterioration over its shelf life.

While the IND is active and before approval, progress reports summarizing the results of the clinical trials and nonclinical studies performed since the last progress report must be submitted at least annually to the FDA, and written IND safety reports must be submitted to the FDA and investigators for serious and unexpected suspected adverse events, findings from other studies suggesting a significant risk to humans exposed to the same or similar drugs, findings from animal or in vitro testing suggesting a significant risk to humans, and any clinically important increased incidence of a serious suspected adverse reaction compared to that listed in the protocol or investigator brochure.

There are also requirements governing the reporting of ongoing clinical trials and completed trial results to public registries. Sponsors of certain clinical trials of FDA-regulated products are required to register and disclose specified clinical trial information, which is publicly available at www.clinicaltrials.gov. Information related to the product, patient population, phase of investigation, trial sites and investigators and other aspects of the clinical trial is then made public as part of the registration. Sponsors are also obligated to discuss the results of their clinical trials after completion. Disclosure of the results of these trials can be delayed until the new product or new indication being studied has been approved. However, there are evolving rules and increasing

requirements for publication of all trial related information, and it is possible that data and other information from trials involving drugs that never garner approval could require disclosure in the future.

U.S. Review and Approval Processes

The results of product development, pre-clinical and other non-clinical studies and clinical trials, along with descriptions of the manufacturing process, analytical tests conducted on the chemistry of the drug, proposed labeling, and other relevant information are submitted to the FDA as part of a BLA requesting approval to market the product. The submission of a BLA is subject to the payment of user fees; a waiver of such fees may be obtained under certain limited circumstances. The user fee for FY 2017 is $2,038,100 for an application containing clinical data. The FDA reviews all BLAs submitted to ensure that they are sufficiently complete for substantive review before it accepts them for filing. The FDA may request additional information rather than accept a BLA for filing. In this event, the BLA must be resubmitted with the additional information. The resubmitted application also is subject to review before the FDA accepts it for filing. Once the submission is accepted for filing, the FDA begins an in depth substantive review. FDA may refer the BLA to an advisory committee for review, evaluation and recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendation of an advisory committee, but it generally follows such recommendations. The approval process is lengthy and often difficult, and the FDA may refuse to approve a BLA if the applicable regulatory criteria are not satisfied or may require additional clinical or other data and information. Even if such data and information is submitted, the FDA may ultimately decide that the BLA does not satisfy the criteria for approval. Data obtained from clinical trials are not always conclusive and the FDA may interpret data differently than Synlogic interprets the same data. The FDA may issue a complete response letter, which may require additional clinical or other data or impose other conditions that must be met in order to secure final approval of the BLA, or an approved letter following satisfactory completion of all aspects of the review process. The FDA reviews an NDA to determine, among other things, whether a product is safe and effective for its intended use and whether its manufacturing is cGMP compliant to assure and preserve the product's identity, strength, quality and purity. The FDA reviews a BLA to determine, among other things whether the product is safe, pure and potent and the facility in which it is manufactured, processed, packed or held meets standards designed to assure the product's continued safety, purity and potency. Before approving a BLA, the FDA will inspect the facility or facilities where the product is manufactured.

BLAs receive either standard or priority review. A drug representing a significant improvement in treatment, prevention or diagnosis of disease may receive priority review. Priority review for an original BLA will be six months from the date that the BLA is filed. In addition, products studied for their safety and effectiveness in treating serious or life threatening illnesses and that provide meaningful therapeutic benefit over existing treatments may receive accelerated approval and may be approved on the basis of adequate and well controlled clinical trials establishing that the drug product has an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit or on the basis of an effect on a clinical endpoint other than survival or irreversible morbidity. As a condition of approval, the FDA may require that a sponsor of a drug receiving accelerated approval perform adequate and well controlled Phase 4 clinical trials. Priority review and accelerated approval do not change the standards for approval, but may expedite the approval process.

After the FDA evaluates a BLA, it will issue an approval letter or a Complete Response Letter ("CRL"). An approval letter authorizes commercial marketing of the drug with prescribing information for specific indications. A CRL indicates that the review cycle of the application is complete and the application will not be approved in its present form. A CRL usually describes the specific deficiencies in the BLA identified by the FDA and may require additional clinical data, such as an additional pivotal Phase 3 trial or other significant and time-consuming requirements related to clinical trials, nonclinical studies or manufacturing. If a CRL is issued, the sponsor must resubmit the BLA, addressing all of the deficiencies identified in the letter, or withdraw the application. Even if such data and information are submitted, the FDA may decide that the BLA does not satisfy the criteria for approval.

If a product receives regulatory approval, the approval may be significantly limited to specific diseases and dosages or the indications for use may otherwise be limited, which could restrict the commercial value of the product. In addition, the FDA may require a sponsor to conduct Phase 4 testing which involves clinical trials designed to further assess a drug's safety and effectiveness after BLA approval, and may require testing and surveillance programs to monitor the safety of approved products which have been commercialized. The FDA may also place other conditions on approval including the requirement for a Risk Evaluation and Mitigation Strategy ("REMS"), to assure the safe use of the drug. If the FDA concludes a REMS is needed, the sponsor of the BLA must submit a proposed REMS. The FDA will not approve the BLA without an approved REMS, if required. A REMS could include medication guides, physician communication plans or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. Any of these limitations on approval or marketing could restrict the commercial promotion, distribution, prescription or dispensing of products. Marketing approval may be withdrawn for non-compliance with regulatory requirements or if problems occur following initial marketing.

The Pediatric Research Equity Act ("PREA"), requires a sponsor to conduct pediatric clinical trials for most drugs and biologics, for a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration. Under PREA, original BLAs and supplements thereto, must contain a pediatric assessment unless the sponsor has received a deferral or waiver. The required assessment must evaluate the safety and effectiveness of the product for the claimed indications in all relevant pediatric subpopulations and support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The sponsor or FDA may request a deferral of pediatric clinical trials for some or all of the pediatric subpopulations. A deferral may be granted for several reasons, including a finding that the drug or biologic is ready for approval for use in adults before pediatric clinical trials are complete or that additional safety or effectiveness data needs to be collected before the pediatric clinical trials begin. Orphan indications are exempt from PREA. The FDA must send a non-compliance letter to any sponsor that fails to submit the required assessment, keep a deferral current or fails to submit a request for approval of a pediatric formulation.

Patent Term Restoration and Marketing Exclusivity

Depending upon the timing, duration and specifics of FDA approval of Synlogic's drugs, some of Synlogic's U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984 (referred to as the "Hatch Waxman Amendments"). The Hatch Waxman Amendments permit a patent restoration term of up to five years as compensation for patent term lost during product development and the FDA regulatory review process. However, patent term restoration cannot extend the remaining term of a patent beyond a total of 14 years from the product's approval date. The patent term restoration period is generally one half the time between the effective date of an IND, and the submission date of a BLA, plus the time between the submission date of a BLA and the approval of that application. Only one patent applicable to an approved drug is eligible for the extension, and the extension must be applied for prior to expiration of the patent. The U.S. Patent and Trademark Office, in consultation with the FDA, reviews and approves the application for any patent term extension or restoration. In the future, Synlogic intends to apply for restorations of patent term for some of its currently-owned or licensed patents to add patent life beyond their current expiration date, depending on the expected length of clinical trials and other factors involved in the filing of the relevant NDA.

Pediatric exclusivity is a type of marketing exclusivity available in the United States. Under the Best Pharmaceuticals for Children Act (the "BPCA"), an additional six months of marketing exclusivity may be available if a sponsor conducts clinical trials in children in response to a written request from the FDA. If a written request does not include clinical trials in neonates, the FDA is required to include its rationale for not requesting those clinical trials. The FDA may request studies on approved or unapproved indications in separate written requests. The issuance of a written request does not require the sponsor to undertake the described clinical trials. To date, Synlogic has not received any written requests.

Biologics Price Competition and Innovation Act of 2009

The ACA, which included the BPCIA, amended the PHSA to create an abbreviated approval pathway for two types of "generic" biologics, biosimilars and interchangeable biologic products, and provides for a 12-year data exclusivity period for the first approved biological product, or reference product, against which a biosimilar or interchangeable application is evaluated; however if pediatric clinical trials are performed and accepted by the FDA, the 12-year data exclusivity period will be extended for an additional six months. Because Synlogic's product candidates will be regulated as biologics, if they are approved they may be subject to competition from biosimilars. A biosimilar product is defined as one that is highly similar to a reference product notwithstanding minor differences in clinically-inactive components and for which there are no clinically meaningful differences between the biological product and the reference product in terms of the safety, purity and potency of the product. An interchangeable product is a biosimilar product that may be substituted for the reference product without the intervention of the health care provider who prescribed the reference product.

The biosimilar applicant must demonstrate that the product is biosimilar based on data from (1) analytical studies showing that the biosimilar product is highly similar to the reference product; (2) animal studies (including toxicity); and (3) one or more clinical trials to demonstrate safety, purity and potency in one or more appropriate conditions of use for which the reference product is approved. In addition, the applicant must show that the biosimilar and reference products have the same mechanism of action for the conditions of use on the label, route of administration, dosage and strength, and the production facility must meet standards designed to assure product safety, purity and potency.

An application for a biosimilar product may not be submitted until four years after the date on which the reference product was first approved. The first approved interchangeable biologic product will be granted an exclusivity period of up to one year after it is first commercially marketed, but the exclusivity period may be shortened under certain circumstances.

The FDA has issued several final and draft guidance documents that provide FDA's current thinking on approaches to demonstrating that a proposed biological product is biosimilar to a reference product. The FDA intends to issue additional guidance documents in the future. Nonetheless, the absence of final guidance documents covering all biosimilars issues does not prevent a sponsor from seeking licensure of a biosimilar under the BPCIA, and the FDA has already approved a few biosimilar applications in the United States.

Orphan Drug Designation

Under the Orphan Drug Act, the FDA may grant orphan drug designation to a drug intended to treat a rare disease or condition, which is generally a disease or condition that affects fewer than 200,000 individuals in the United States, or more than 200,000 individuals in the United States and for which there is no reasonable expectation that the cost of developing and making available in the United States a drug for this type of disease or condition will be recovered from sales in the United States for that drug. Orphan drug designation must be requested before submitting a BLA. After the FDA grants orphan drug designation, the identity of the therapeutic agent and its potential orphan use will be disclosed publicly by the FDA; the posting will also indicate whether a drug is no longer designated as an orphan drug. More than one product candidate may receive an orphan drug designation for the same indication. Orphan drug designation does not convey any advantage in or shorten the duration of the regulatory review and approval process.

If a product that has orphan drug designation subsequently receives the first FDA approval for the disease for which it has such designation, the product is entitled to seven years of orphan product exclusivity, except in very limited circumstances. The FDA issued a final rule, effective August 12, 2013, intended to clarify several regulatory provisions, among which was a clarification of some of those limited circumstances. One of the provisions makes clear that the FDA will not recognize orphan drug exclusive approval if a sponsor fails to demonstrate upon approval that the drug is clinically superior to a previously approved drug, regardless of

whether or not the approved drug was designated an orphan drug or had orphan drug exclusivity. Thus orphan drug exclusivity could also block the approval of one of Synlogic's products for seven years if a competitor obtains approval of the same drug as defined by the FDA and Synlogic is not able to show the clinical superiority of its drug or if Synlogic's product candidate is determined to be contained within the competitor's product for the same indication or disease.

In August 2016, the FDA granted Synlogic orphan drug designation for its lead product candidate *E. coli* Nissle bacterium modified to metabolize ammonia for the treatment of urea cycle disorders. Orphan drug designation will provide Synlogic with seven years of market exclusivity that begins when the BLA for the drug receives FDA marketing approval for the use for which the orphan drug status was granted.

Expedited Review and Approval

The FDA has various programs, including Fast Track, priority review, and accelerated approval, which are intended to expedite or simplify the process for reviewing drugs, and/or provide for approval on the basis of surrogate endpoints. Even if a drug qualifies for one or more of these programs, the FDA may later decide that the drug no longer meets the conditions for qualification or that the time period for FDA review or approval will not be shortened. Generally, drugs that may be eligible for these programs are those for serious or life-threatening conditions, those with the potential to address unmet medical needs, and those that offer meaningful benefits over existing treatments. For example, Fast Track is a process designed to facilitate the development, and expedite the review, of drugs to treat serious diseases and fill an unmet medical need. The request may be made at the time of IND submission and generally no later than the pre-BLA meeting. The FDA will respond within 60 calendar days of receipt of the request. Priority review, which is requested at the time of BLA submission, is designed to give drugs that offer major advances in treatment or provide a treatment where no adequate therapy exists an initial review within six months as compared to a standard review time of 10 months. Although Fast Track and priority review do not affect the standards for approval, the FDA will attempt to facilitate early and frequent meetings with a sponsor of a Fast Track designated drug and expedite review of the application for a drug designated for priority review. Accelerated approval provides an earlier approval of drugs that treat serious diseases, and that fill an unmet medical need based on a surrogate endpoint, which is a laboratory measurement or physical sign used as an indirect or substitute measurement representing a clinically meaningful outcome. Discussions with the FDA about the feasibility of an accelerated approval typically begin early in the development of the drug in order to identify, among other things, an appropriate endpoint. As a condition of approval, the FDA may require a sponsor of a drug receiving accelerated approval to perform post-marketing clinical trials to confirm the appropriateness of the surrogate marker trial.

In the Food and Drug Administration Safety and Improvement Act ("FDASIA"), Congress encouraged the FDA to utilize innovative and flexible approaches to the assessment of products under accelerated approval. The law required the FDA to issue related draft guidance within a year after the law's enactment and also promulgate confirming regulatory changes. The FDA published a final guidance on May 30, 2014, entitled "Expedited Programs for Serious Conditions—Drugs and Biologics." One of the expedited programs added by FDASIA is that for Breakthrough Therapy. A Breakthrough Therapy designation is designed to expedite the development and review of drugs that are intended to treat a serious condition where preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over available therapy on a clinically significant endpoint. A sponsor may request Breakthrough Therapy designation at the time that the IND is submitted, or no later than at the end of Phase 2 meeting. The FDA will respond to a Breakthrough Therapy designation request within 60 days of receipt of the request. A drug that receives Breakthrough Therapy designation is eligible for all Fast Track designation features, intensive guidance on an efficient drug development program, beginning as early as Phase 1 and commitment from the FDA involving senior managers. FDA has already granted this designation to several new biologics and two have received approval as of the end of March 2017.

Post-Approval Requirements

Once an approval is granted, the FDA may withdraw the approval if compliance with regulatory standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product may result in restrictions on the product or even complete withdrawal of the product from the market. After approval, some types of changes to the approved product, such as adding new indications, certain manufacturing changes and additional labeling claims, are subject to further FDA review and approval. Drug manufacturers and other entities involved in the manufacture and distribution of approved drugs are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMP and other laws and regulations. Synlogic relies, and expects to continue to rely, on third parties for the production of clinical and commercial quantities of its products. Future inspections by the FDA and other regulatory agencies may identify compliance issues at the facilities of Synlogic's contract manufacturers that may disrupt production or distribution, or require substantial resources to correct.

Any drug products manufactured or distributed by Synlogic or Synlogic's partners pursuant to FDA approvals are subject to continuing regulation by the FDA, including, among other things, record keeping requirements, reporting of adverse experiences with the drug, providing the FDA with updated safety and efficacy information, drug sampling and distribution requirements, complying with certain electronic records and signature requirements, and complying with FDA promotion and advertising requirements. FDA strictly regulates labeling, advertising, promotion and other types of information on products that are placed on the market. Drugs may be promoted only for the approved indications and in accordance with the provisions of the approved label.

From time-to-time, legislation is drafted, introduced and passed in Congress that could significantly change the statutory provisions governing the approval, manufacturing and marketing of products regulated by the FDA. It is impossible to predict whether further legislative changes will be enacted, or FDA regulations, guidance or interpretations changed or what the impact of such changes, if any, may be.

Foreign Regulation

In addition to regulations in the United States, Synlogic will be subject to a variety of foreign regulations governing clinical trials and commercial sales and distribution of its products. Whether or not Synlogic obtains FDA approval for a product, Synlogic must obtain approval by the comparable regulatory authorities of foreign countries or economic areas, such as the European Union, before it may commence clinical trials or market products in those countries or areas. The approval process and requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement vary greatly from place to place, and the time may be longer or shorter than that required for FDA approval.

Under European Union regulatory systems, a company may submit marketing authorization applications either under a centralized or decentralized procedure. The centralized procedure, which is compulsory for medicinal products produced by biotechnology or those medicinal products containing new active substances for specific indications such as the treatment of AIDS, cancer, neurodegenerative disorders, diabetes, viral diseases and designated orphan medicines, and optional for other medicines which are highly innovative. Under the centralized procedure, a marketing application is submitted to the European Medicines Agency where it will be evaluated by the Committee for Medicinal Products for Human Use and a favorable opinion typically results in the grant by the European Commission of a single marketing authorization that is valid for all European Union member states within 67 days of receipt of the opinion. The initial marketing authorization is valid for five years, but once renewed is usually valid for an unlimited period. The decentralized procedure provides for approval by one or more "concerned" member states based on an assessment of an application performed by one member state, known as the "reference" member state. Under the decentralized approval procedure, an applicant submits an application, or dossier, and related materials to the reference member state and concerned member states. The

reference member state prepares a draft assessment and drafts of the related materials within 120 days after receipt of a valid application. Within 90 days of receiving the reference member state's assessment report, each concerned member state must decide whether to approve the assessment report and related materials. If a member state does not recognize the marketing authorization, the disputed points are eventually referred to the European Commission, whose decision is binding on all member states.

As in the United States, Synlogic may apply for designation of a product as an orphan drug for the treatment of a specific indication in the European Union before the application for marketing authorization is made. Orphan drugs in Europe enjoy economic and marketing benefits, including up to 10 years of market exclusivity for the approved indication unless another applicant can show that its product is safer, more effective or otherwise clinically superior to the orphan designated product.

Reimbursement

Sales of pharmaceutical products depend in significant part on the availability of third party reimbursement. Third party payors include government healthcare programs such as Medicare, managed care providers, private health insurers and other organizations. Synlogic anticipates third party payors will provide reimbursement for its products. However, these third party payors are increasingly challenging the price and examining the cost effectiveness of medical products and services. In addition, significant uncertainty exists as to the reimbursement status of newly-approved healthcare products. Synlogic may need to conduct expensive pharmacoeconomic studies in order to demonstrate the cost effectiveness of its products. Synlogic's product candidates may not be considered cost effective. It is time consuming and expensive for Synlogic to seek reimbursement from third party payors. Reimbursement may not be available or sufficient to allow Synlogic to sell its products on a competitive and profitable basis.

Medicare is a federal healthcare program administered by the federal government that covers individuals age 65 and over as well as individuals with certain disabilities. Drugs may be covered under one or more sections of Medicare depending on the nature of the drug and the conditions associated with and site of administration. For example, under Part D, Medicare beneficiaries may enroll in prescription drug plans offered by private entities which provide coverage for outpatient prescription drugs. Part D plans include both stand-alone prescription drug benefit plans and prescription drug coverage as a supplement to Medicare Advantage plans. Unlike Medicare Parts A and B, Part D coverage is not standardized. Part D prescription drug plan sponsors are not required to pay for all covered Part D drugs, and each drug plan can develop its own drug formulary that identifies which drugs it will cover and at what tier or level.

Medicare Part B covers most injectable drugs given in an in-patient setting and some drugs administered by a licensed medical provider in hospital outpatient departments and doctors' offices. Medicare Part B is administered by Medicare Administrative Contractors, which generally have the responsibility of making coverage decisions. Subject to certain payment adjustments and limits, Medicare generally pays for a Part B-covered drug based on a percentage of manufacturer-reported average sales price, which is regularly updated. Synlogic believes that its product candidates that are intended to be administered intratumorally will be subject to the Medicare Part B rules.

Synlogic expects that there will continue to be a number of federal and state proposals to implement governmental pricing controls and limit the growth of healthcare costs, including the cost of prescription drugs. For example, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Affordability Reconciliation Act of 2010 (collectively, "ACA") enacted in March 2010, was expected to have a significant impact on the health care industry. ACA resulted in expanded coverage for the previously uninsured, however, President Trump ran for office on a platform that supported the repeal of the ACA and one of his first actions after his inauguration was to sign an Executive Order commanding federal agencies to try to waive or delay requirements of the ACA that impose economic or regulatory burdens on states, families, the health care industry and others. In March 2017, following the passage of the budget resolution for fiscal year 2017, the U.S. House of

Representatives passed legislation known as the American Health Care Act, which, if enacted, would amend or repeal significant portions of the ACA. The U.S. Senate is currently considering its own legislation, and while Synlogic believes that the Senate is unlikely to adopt the American Health Care Act as passed by the House of Representatives, Synlogic cannot predict whether the Senate will ever introduce its own bill, what a Senate bill will contain if it does, or whether the House of Representatives and the Senate will ultimately agree on a joint bill.

In addition, in some foreign countries, the proposed pricing for a drug must be approved before it may be lawfully marketed. The requirements governing drug pricing vary widely from country to country. For example, the European Union provides options for its member states to restrict the range of medicinal products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. A member state may approve a specific price for the medicinal product or it may instead adopt a system of direct or indirect controls on the profitability of Synlogic placing the medicinal product on the market. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of Synlogic's products. Historically, products launched in the European Union do not follow price structures of the United States and generally tend to be significantly lower.

Other Regulatory Matters

Synlogic is subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. These operations may involve the use of hazardous and flammable materials, including chemicals and biological materials. Synlogic's operations may also produce hazardous waste products. Synlogic contracts with third parties for the disposal of these materials and wastes.

Manufacturing

Synlogic has made and continues to make significant investments to develop manufacturing processes designed to allow it to reproducibly manufacture high quality living medicines at clinical scale and, later, at commercial scale to enable approval of its product candidates. Synlogic has a small-scale internal development group to support discovery and pre-clinical research and is building the organization to support scale-up and development towards commercialization. Synlogic currently works with contract manufacturing organizations ("CMOs") for clinical material and formulation development work.

Synlogic has successfully transferred its manufacturing process for its lead hyperammonemia program to a CMO where it was used to manufacture Phase 1 clinical material pursuant to FDA's cGMP requirements. Synlogic is similarly undertaking manufacturing technology transfer for its PKU program to supply material for its IND-enabling studies and subsequently for Phase 1 clinical trials.

These first clinical materials use a liquid formulation. Synlogic is investing in formulation development in parallel with Phase 1 clinical trial progress with the goal of providing a solid dose oral formulation (tablets or capsules) for later stage clinical development and commercial presentation, likely with a sachet formulation for pediatric use.

To enable the production of high levels of cells, or biomass, that can be administered as activated living medicines to perform metabolic functions, Synlogic can engineer its Synthetic Biotic medicines with switches. These switches are comprised of transcription factor and promoter pairs that allow for controlled expression of the therapeutic effectors produced by its Synthetic Biotic medicines. To ensure the metabolic capacity of the cells is allotted to the production of a high level of biomass during manufacturing, the effector circuits in the Synthetic Biotic programs are not expressed during this growth phase. At the end of the manufacturing process, the circuits are then induced, or activated. This two-step approach was designed to enable a high level of biomass production as well as to deliver the required activity necessary at the time of administration.

As Synlogic progresses in clinical development, it will need to scale up from Phase 1 clinical-scale to commercial-scale manufacturing. Synlogic is in the process of assessing CMOs who meet its criteria to supply its later-stage clinical development and commercial supply. Synlogic plans to compare the merits of working with one or more CMOs who meet its criteria with the possibility of building cGMP manufacturing capacity and capabilities internally.

Competition

The biotechnology industry is extremely competitive in the race to develop new products. While Synlogic believes it has significant competitive advantages with its industry-leading expertise in synthetic biology and metabolic engineering of probiotic bacteria, its clinical development expertise, and dominant intellectual property position, Synlogic currently faces and will continue to face competition for its development programs from companies that use synthetic biology or cell therapy development platforms and from companies focused on more conventional therapeutic modalities such as small molecules and antibodies. The competition is likely to come from multiple sources, including larger pharmaceutical companies, biotechnology companies and academia. Many of these competitors may have access to greater capital and resources than Synlogic. These competitors also compete with Synlogic in recruiting and retaining qualified scientific and management personnel, in establishing clinical trial sites and patient registration for clinical trials, and in accessing technologies to enable Synlogic's programs. For any products that Synlogic may ultimately commercialize, not only will Synlogic compete with any existing therapies and those therapies currently in development, but it will also have to compete with new therapies that may become available in the future.

Competitors to Synlogic's efforts to provide living medicines to patients with a wide range of indications include other synthetic biology companies developing other synthetic biology methods, cellular and microbiome-based companies, DNA and RNA-based companies, as well as companies developing small molecules or other biologics. In the case of indications that Synlogic is targeting with Synlogic's own Synthetic Biotic medicines, competitors include, but are not limited to:

- *UCD*
  - Horizon Pharma plc has a licensed product; and
  - Dimension Therapeutics, Inc., Aeglea Biotherapeutics, Inc., Arcturus Therapeutics Inc., Castle Creek Pharma LLC, PhaseRx, Inc., RaNA Therapeutics and Selecta Biosciences, Inc. are each involved with discovery or pre-clinical stage product candidates.
- *HE*
  - Valeant Pharmaceuticals International, Inc. has a licensed product; and
  - Ocera Therapeutics, Inc., Umecrine Cognition AB and Salix Pharmaceuticals, Ltd, as well as other pre-clinical and discovery stage companies are each developing product candidates.
- PKU
  - BioMarin, Inc. has a licensed and development stage product; and
  - MipSalus ApS, Codexis, Inc., Dimension Therapeutics, Inc. and Synthetic Biologics, Inc. are each developing product candidates.

The Synlogic Team: Executives, Founders and Scientific Advisors

Synlogic's team of executives has proven track records of successfully translating scientific visions into successful commercial therapeutic products, solving complex issues in developing novel therapeutics and progressing new and novel products through regulatory approval. Synlogic's scientific founders, Timothy Lu, M.D., Ph.D., and James Collins, Ph.D., are experts in the emerging field of synthetic biology. In addition to

Synlogic's management team and founders, it has established advisory relationships with researchers and clinicians dedicated to the development of Synthetic Biotic therapeutic products for patients with significant unmet medical needs and whose expertise spans synthetic biology, metabolic engineering, metabolism, immuno-modulation and immune-oncology arenas. Synlogic's scientific advisors include Dr. Lu and Dr. Collins; Christopher Voigt, Ph.D., Cammie Lesser, M.D., Ph.D. and Kristala Prather, Ph.D., experts in synthetic biology and bacterial metabolism; and Charles Mackay, Ph.D., Ulrich von Andrian, M.D., Ph.D. and Sangeeta Bhatia, M.D., Ph.D., experts in immunomodulation and oncology. Synlogic intends to expand its advisory boards as Synlogic grows. All of Synlogic's founders and advisors are equity holders in Synlogic and receive compensation as scientific advisors. Although they are regularly available for scientific consultation, Synlogic's arrangements with these individuals do not entitle Synlogic to any of their existing or future intellectual property derived from their independent research or research with other third parties.

Employees

As of May 31, 2017, Synlogic had 37 full-time employees, 24 of whom have an M.D. or Ph.D. Of Synlogic's full-time employees, 28 were primarily engaged in research and development activities. None of Synlogic's employees are subject to a collective bargaining agreement. Synlogic believes that it has good relations with employees.

Facilities

Synlogic currently leases facilities at 200 Sidney Street, Suite 320, Cambridge, Massachusetts 02139 containing its research and development, laboratory and office spaces. This facility consists of approximately 14,390 square feet. Synlogic's lease expires in April 2021. However, this lease is likely to be terminated prematurely by agreement as Synlogic negotiates to enter into a new lease to replace the current Sidney Street facilities with increased occupancy in the first quarter of 2018.

Legal Proceedings

Synlogic is not currently a party to any material legal proceedings.

Corporate Information

Synlogic was incorporated in Delaware on March 14, 2014 under the name TMC Therapeutics Inc. Its principal executive offices are located at 200 Sidney Street, Suite 320, Cambridge, Massachusetts 02139 and its telephone number is (617)-401-9947. Synlogic's website is www.synlogictx.com. References to Synlogic's website are inactive textual references only and the content of Synlogic's website should not be deemed incorporated by reference into this proxy statement/prospectus/information statement.

SYNLOGIC REORGANIZATION

Between May 10 and May 15, 2017, Synlogic completed a series of transactions pursuant to which Synlogic acquired all assets of Synlogic, LLC, formerly Synlogic's sole stockholder and holding company parent, and assumed all of its liabilities and obligations by operation of law. Throughout this proxy statement/prospectus/information statement, these transactions and the related transactions enumerated below are referred to collectively as the "Reorganization." To consummate the Reorganization, Synlogic completed the following transactions:

- filing of a certificate of merger with the Secretary of State of the State of Delaware on May 10, 2017, whereby Synlogic IBDCo, Inc., formerly a subsidiary of Synlogic, LLC, merged with and into a wholly owned subsidiary of Synlogic and continued to exist as the surviving corporation;
- filing of Synlogic's amended and restated certificate of incorporation with the Secretary of State of the State of Delaware on May 11, 2017; and
- filing of a certificate of merger with the Secretary of State of the State of Delaware on May 15, 2017, whereby Synlogic, LLC merged with and into Synlogic, and Synlogic continued to exist as the surviving corporation.

In connection with the Reorganization, Synlogic issued shares of Synlogic Preferred Stock to holders of Synlogic, LLC's outstanding preferred units as follows:

- holders of Synlogic, LLC's outstanding Class B preferred units received one share of Synlogic's Series B preferred stock for each Class B preferred unit held immediately prior to the Reorganization, with an aggregate of 5,425,829 shares of Synlogic's Series B preferred stock issued in the Reorganization;
- holders of Synlogic, LLC's outstanding Class A-3 preferred units received one share of Synlogic's Series A-3 preferred stock for each Class A-3 preferred unit held immediately prior to the Reorganization, with an aggregate of 4,279,162 shares of Synlogic's Series A-3 preferred stock issued in the Reorganization;
- holders of Synlogic, LLC's outstanding Class A-2 preferred units received one share of Synlogic's Series A-2 preferred stock for each Class A-2 preferred unit held immediately prior to the Reorganization, with an aggregate of 2,572,912 shares of Synlogic's Series A-2 preferred stock issued in the Reorganization; and
- holders of Synlogic, LLC's outstanding Class A-1 preferred units received one share of Synlogic's Series A-1 preferred stock for each Class A-1 preferred unit held immediately prior to the Reorganization, with an aggregate of 1,650,678 shares of Synlogic's Series A-1 preferred stock issued in the Reorganization.

Synlogic's Series B preferred stock, Series A-3 preferred stock, Series A-2 preferred stock and Series A-1 preferred stock are designated as preferred stock under Synlogic's amended and restated certificate of incorporation.

Holders of Synlogic, LLC's outstanding common units received one share of Synlogic Common Stock for each common unit held immediately prior to the Reorganization, with an aggregate of 3,652,150 shares of Synlogic Common Stock issued in the Reorganization. Holders of Synlogic, LLC's outstanding incentive units which were issued under Synlogic, LLC's 2015 Equity Incentive Plan received Synlogic Common Stock subject to restricted stock agreements in an amount equal in value to the appreciation of such incentive units between the date of grant and immediately prior to the Reorganization, with an aggregate of 1,260,506 shares of Synlogic Common Stock issued in the Reorganization under the Synlogic 2017 Stock Incentive Plan.

The purpose of the Reorganization was to reorganize Synlogic's corporate structure so that Synlogic would continue as a corporation and as the parent company of IBDCo, and so that Synlogic's investors would own Synlogic Capital Stock rather than equity interests in a limited liability company. For the convenience of the reader, except as context otherwise requires, all information included in this proxy statement/prospectus/information statement is presented giving effect to the Reorganization.

MIRNA MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion and analysis of financial condition and results of operations should be read together with the section entitled "Selected Historical and Unaudited Pro Forma Condensed Combined Financial Data—Selected Historical Financial Data of Mirna" and the financial statements of Mirna and accompanying notes, each appearing elsewhere in this proxy statement/prospectus/information statement. This discussion of the Mirna financial condition and results of operations contains certain statements that are not strictly historical and are "forward-looking" statements within the meaning of the Private Securities Litigation Reform Act of 1995 and involve a high degree of risk and uncertainty. Actual results may differ materially from those projected in the forward-looking statements due to other risks and uncertainties that exist in Mirna's operations, development efforts and business environment, including those set forth in the section entitled "Risk Factors—Risks Related to Mirna" in this proxy statement/prospectus/information statement, the other risks and uncertainties described in the section entitled "Risk Factors" in this proxy statement/prospectus/information statement and the other risks and uncertainties described elsewhere in this proxy statement/prospectus/information statement. All forward-looking statements included in this proxy statement/prospectus/information statement are based on information available to Mirna as of the date hereof, and Mirna assumes no obligation to update any such forward-looking statement.

Overview

Mirna is a biopharmaceutical company that has historically focused on microRNA-based oncology therapeutics, which are short RNA molecules, or oligonucleotides.

Mirna's first product candidate, MRX34, was studied as a single agent in a Phase 1 clinical trial. In September 2016, Mirna voluntarily halted the Phase 1 trial following multiple immune-related SAEs observed in patients dosed with MRX34. Subsequently, Mirna received notification from the FDA that the IND for MRX34 was on full clinical hold. Following the suspension of the Phase 1 trial for MRX34 and the FDA's clinical hold on the IND for MRX34, Mirna discontinued development of MRX34 and its microRNA product pipeline and closed its IND.

In November 2016, Mirna discontinued research and development activities to reduce operating expenses while Mirna evaluated strategic alternatives with a goal to enhance stockholder value, including the Merger and, if the Merger is not completed, the possibility of another merger or sale of Mirna. Mirna also initiated a plan in November 2016 to reduce personnel and expenses to preserve capital and further streamline operations consistent with its decision to discontinue development of MRX34 and its microRNA product pipeline. Mirna expects to devote significant time and resources to completion of the Merger or identifying and evaluating strategic alternatives. However, there can be no assurance that such activities will result in the completion of the Merger or any other agreements or transactions that will enhance shareholder value. Further, the completion of the Merger, or of any other strategic transaction, ultimately may not deliver the anticipated benefits or enhance shareholder value.

Mirna was incorporated in 2007 under the laws of Delaware and was maintained as a wholly owned subsidiary of its former parent company, Asuragen, until the end of 2009, when Mirna became an independent entity.

Mirna's operations have historically focused on developing its understanding of and capabilities in microRNA biology, identifying potential product candidates, undertaking pre-clinical studies, initiating and conducting a clinical trial, protecting and enhancing Mirna's intellectual property estate and providing general and administrative support for these activities. Mirna has not generated any revenue from product sales and, to date, has funded its operations primarily through the private placement of convertible preferred stock, federal and state government grants, offerings of Mirna Common Stock, and support from its former parent company,

Asuragen. From inception through March 31, 2017, Mirna has raised an aggregate of approximately $167.3 million to fund its operations, of which approximately $89.9 million was from the issuance of preferred stock for cash and assets, $48.7 million from a public offering of Mirna Common Stock, $16.8 million from a private placement of Mirna Common Stock and $11.9 million from federal and state grants.

Since inception, Mirna has incurred significant operating losses. Mirna's net loss was $26.3 million for the year ended December 31, 2016 and $5.0 million for the three months ended March 31, 2017. At March 31, 2017, Mirna had an accumulated deficit of $107.8 million. Mirna expects to continue to incur significant expenses and operating losses. Mirna's net losses may fluctuate significantly from quarter to quarter and from year to year. Mirna anticipates that its expenses will continue to decrease as it discontinued research and development activities, further reduce headcount, and focus on evaluating Mirna's strategic alternatives with a goal to enhance stockholder value, including the Merger or, if the Merger is not completed, the possibility of another merger or sale of Mirna.

Merger Agreement

After conducting a diligent and extensive process of evaluating strategic alternatives for Mirna and identifying and reviewing potential candidates for a strategic acquisition or other transaction, which included the careful evaluation and consideration of proposals from interested parties, and following extensive negotiation with Synlogic, on May 15, 2017, Mirna, Merger Sub and Synlogic entered into the Merger Agreement. Pursuant to the Merger Agreement, among other matters, and subject to the satisfaction or waiver of the conditions set forth in the Merger Agreement, Merger Sub will merge with and into Synlogic, with Synlogic continuing as a wholly owned subsidiary of Mirna and the surviving corporation of the Merger. The Merger is intended to qualify for U.S. federal income tax purposes as a reorganization under the provisions of Section 368(a) of the Internal Revenue Code of 1986, as amended.

Subject to the terms and conditions of the Merger Agreement, at the closing of the Merger, (a) each outstanding share of Synlogic Common Stock and Synlogic Preferred Stock will be converted into the right to receive a number of shares of Mirna Common Stock equal to the exchange ratio described below; and (b) each outstanding Synlogic Option that has not previously been exercised prior to the closing of the Merger will be assumed by Mirna and converted into an option to purchase shares of Mirna Common Stock, with the number of Mirna's shares subject to such option and the exercise price being appropriately adjusted to reflect the Exchange Ratio.

The Merger is intended to qualify for U.S. federal income tax purposes as a reorganization under the provisions of Section 368(a) of the Internal Revenue Code of 1986, as amended.

Under the exchange ratio formula in the Merger Agreement, as of immediately after the Merger, the former Synlogic Stockholders are expected to own approximately 83% of the outstanding shares of Mirna Common Stock on a fully-diluted basis and Mirna Stockholders as of immediately prior to the Merger are expected to own approximately 17% of the outstanding shares of Mirna Common Stock on a fully-diluted basis. The exchange ratio will be adjusted to the extent that Mirna's net cash at closing is greater than or less than $40 million, as described further in the Merger Agreement.

Consummation of the Merger is subject to certain closing conditions, including, among other things, approval by the stockholders of Mirna and Synlogic, and Mirna's satisfaction of a minimum net cash threshold of $33.5 million at closing. In accordance with the terms of the Merger Agreement, (i) certain executive officers, directors and stockholders of Synlogic (solely in their respective capacities as Synlogic Stockholders) holding approximately 77% of the outstanding Synlogic Capital Stock (giving effect to Synlogic's recent Series C financing) have entered into support agreements with Mirna to vote all of their shares of Synlogic Capital Stock in favor of adoption of the Merger Agreement and (ii) certain executive officers, directors and stockholders of Mirna (solely in their respective capacities as Mirna stockholders) holding approximately 33% of the outstanding

Mirna Common Stock have entered into support agreements with Synlogic to vote all of their shares of Mirna Common Stock in favor of approval of the Merger Agreement. These support agreements include covenants with respect to the voting of such shares in favor of approving the transactions contemplated by the Merger Agreement and against any competing acquisition proposals and place certain restrictions on the transfer of the shares of Mirna and Synlogic held by the respective signatories thereto.

Concurrently with the execution of the Merger Agreement, certain officers, directors and stockholders of Mirna holding approximately 33% of the outstanding Mirna Common Stock and certain officers, directors and stockholders of Synlogic holding approximately 81% of the Synlogic Capital Stock (giving effect to Synlogic's recent Series C financing) have entered into lock-up agreements pursuant to which they accepted certain restrictions on transfers of shares of Mirna Common Stock for the 180-day period following the closing of the Merger.

The Merger Agreement contains certain termination rights for both Mirna and Synlogic, and further provides that, upon termination of the Merger Agreement under specified circumstances, either party may be required to pay the other party a termination fee of $2.0 million, or in some circumstances reimburse the other party's expenses up to a maximum of $1.0 million.

At the effective time of the Merger, the Mirna Board of Directors is expected to consist of seven members, five of whom will be designated by Synlogic and two of whom will be designated by Mirna.

Financial Operations Overview

Revenue

Mirna has not generated any revenue from product sales or from collaborations. In the future, Mirna may generate revenue following a potential strategic transaction. Revenue may fluctuate from period to period, and the timing and extent of any future revenue may depend on Mirna's ability to consummate a strategic transaction.

Research and Development Expenses

Research and development expenses have consisted primarily of costs incurred for Mirna's research activities, including its drug discovery efforts, and the development of its product candidates, which included the following:

- employee related expenses, including salaries, benefits, travel and stock based compensation;
- external research and development expenses incurred under arrangements with third parties, such as CROs, consultants and Mirna's scientific advisory board;
- lab supplies, and acquiring, developing and manufacturing pre-clinical study materials in accordance with cGLP;
- costs of clinical trials, including costs for management, investigator fees and related vendors that provide services for the clinical trials;
- costs to manufacture the drug used in the clinical trials in accordance with cGMP;
- license and milestone fees;
- development and prosecution of intellectual property; and
- costs of facilities, depreciation and other expenses.

In September 2016, Mirna announced its decision to close the Phase 1 study of MRX34 and voluntarily halted the enrollment and dosing of patients in the study. Further, in November 2016, Mirna discontinued research and development activities to reduce operating expenses.

Research and development costs have been expensed as incurred. In certain circumstances, Mirna has made nonrefundable advance payments to purchase goods and services for future use pursuant to contractual arrangements. In those instances, Mirna deferred and recognized an expense in the period that it receives or consumes the goods or services.

Mirna's research and development expenses have been offset by proceeds derived from federal and state grants. These government grants, which have supplemented Mirna's research efforts on specific projects, generally provided for reimbursement of approved costs, as defined in the terms of the grant awards. The proceeds from these reimbursement grants are treated as a reduction to the associated expenses as the allowable expenses are incurred.

Prior to discontinuing its research and development activities, at any point in time, Mirna typically had various early stage research and drug discovery projects ongoing. Mirna's internal resources, employees and infrastructure were not directly tied to any one research or drug discovery project and were typically deployed across multiple projects. As such, Mirna did not maintain information regarding the costs incurred for these early stage research and drug discovery programs on a project-specific basis. However, Mirna historically spent the vast majority of its research and development resources on its first product candidate, MRX34, development of which has been stopped.

Mirna anticipates that its research and development expenses will continue to decrease as Mirna discontinued its research and development activities, further reduces headcount, and focuses on evaluating strategic alternatives with a goal to enhance stockholder value, including the Merger or, if the Merger is not completed, the possibility of another merger or sale of Mirna.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries and related benefits, including stock-based compensation, related to Mirna's executive, finance and support functions. Other general and administrative expenses include allocated facility-related costs not otherwise included in research and development expenses, travel expenses and professional fees for auditing, tax and legal services.

Critical Accounting Policies and Estimates

Management's discussion and analysis of Mirna's financial condition and results of operations are based on Mirna's financial statements, which have been prepared in accordance with generally accepted accounting principles. The preparation of these financial statements requires Mirna to make estimates and judgments that affect the reported amounts of assets, liabilities, and expenses and the disclosure of contingent assets and liabilities in Mirna's financial statements. On an ongoing basis, Mirna evaluates its estimates and judgments, including those related to stock-based compensation, clinical trial and pre-clinical study accruals and restructuring charges. Mirna bases its estimates on historical experience, known trends and events and various other factors that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions. In making estimates and judgments, management employs critical accounting policies.

While Mirna's significant accounting policies are described in the notes to financial statements appearing elsewhere in this proxy statement/prospectus/information statement, Mirna believes that the following critical accounting policies are most important to understanding and evaluating its reported financial results.

Stock-Based Compensation

Mirna accounts for its stock-based compensation awards in accordance with ASC Topic 718, *Compensation—Stock Compensation* ("ASC 718"). ASC 718 requires all stock-based payments to employees,

including grants of employee stock options, to be recognized in the statements of operations based on their grant date fair values. For stock options granted to employees and to members of the Mirna Board of Directors for their services on the board of directors, Mirna estimates the grant date fair value of each option award using the Black-Scholes option-pricing model. The use of the Black-Scholes option-pricing model requires Mirna's management to make assumptions with respect to the expected term of the option, the expected volatility of the Mirna Common Stock consistent with the expected life of the option, risk-free interest rates and expected dividend yields of the common stock. For awards subject to service-based vesting conditions, Mirna recognizes stock-based compensation expense, net of estimated forfeitures, equal to the grant date fair value of stock options on a straight-line basis over the requisite service period.

Clinical Trial and Pre-Clinical Study Accruals

Prior to discontinuing its research and development activities, Mirna estimated pre-clinical study and clinical trial expenses pursuant to contracts with research institutions and CROs that conduct and manage pre-clinical studies and clinical trials on Mirna's behalf. These estimates were based on the level of service performed and the underlying agreement. Further, Mirna accrued expenses related to clinical trials based on the level of patient enrollment and other activities according to the related agreements. At such time, Mirna monitored patient enrollment levels and other activities to the extent reasonably possible and adjusted estimates accordingly. If actual costs incurred or the timing of services varied from Mirna's estimate, it adjusted the accrual accordingly. On September 20, 2016 Mirna announced its decision to close the ongoing Phase 1 study of MRX34 and halted enrollment and dosing of patients in the study.

Restructuring

Following the closing of the Phase 1 MRX34 clinical trial, Mirna implemented a workforce reduction in the fourth quarter of 2016 to reduce operating expenses while Mirna evaluated strategic alternatives. The majority of severance and benefits payments were settled during the first quarter of 2017. Mirna entered into retention agreements with key employees if these employees remained with Mirna until June 30, 2017 or were terminated by Mirna without cause prior to such date. Mirna has recognized the restructuring liability for such retention agreements over its employees' service period.

In accordance with ASC 420, *Exit and Disposal Cost Obligations*, Mirna has also recognized contract termination costs in connection with a leased property it intended to occupy as its corporate headquarters and research facility, as well as a temporary lab in use prior to the suspension of Mirna's research and development activities. In addition, Mirna has recognized asset impairments related to its lab equipment used in the Phase 1 clinical trial, construction in process, and other property and equipment for which Mirna does not expect to receive a future benefit.

Amounts recorded in restructuring charges can result from a complex series of judgments about future events and uncertainties and can heavily rely on estimates and assumptions.

Results of Operations

Comparison of three months ended March 31, 2017 and 2016:

	Three Months Ended March 31,		Dollar Change	% Change
	2017	2016	(in thousands)	
Statement of operations data:				
Operating expenses:				
Research and development	$ 242	$ 4,523	$(4,281)	(94.6)%
General and administrative	2,264	2,130	134	6.3%
Restructuring charges	2,557	—	2,557	100.0%
Interest (income)	(86)	(82)	(4)	4.9%
Net loss	$ 4,977	$ 6,571	$(1,594)	(24.3)%

Research and Development Expenses

Research and development expenses were $0.2 million for the three months ended March 31, 2017 which was a decrease of $4.3 million or 95%, compared to research and development expenses of approximately $4.5 million for the three months ended March 31, 2016. The decrease in the three months ended March 31, 2017 was primarily due to the discontinuation of Mirna's research and development activities, including development of MRX34 and Mirna's microRNA pipeline, and corresponding reduction in force, both of which were implemented in November 2016 to reduce operating expenses and streamline operations while Mirna evaluates strategic alternatives.

Mirna anticipates that its research and development expenses will continue to decrease as Mirna discontinued its research and development activities, further reduces headcount, and focuses on evaluating its strategic alternatives with a goal to enhance stockholder value, including the Merger or, if the Merger is not completed, the possibility of another merger or sale of Mirna.

General and Administrative Expenses

General and administrative expenses were approximately $2.3 million for the three months ended March 31, 2017, which was an increase of approximately $0.1 million or 6%, compared to general and administrative expenses of $2.1 million for the three months ended March 31, 2016. The increase in the three months ended March 31, 2017 was primarily due to approximately $0.5 million in legal fees for transaction costs related to Mirna's evaluation of strategic alternatives. This increase was largely offset by a decline in personnel and operating expenses following the reduction in force implemented in November 2016 to reduce costs and streamline operations while Mirna evaluates strategic alternatives.

Restructuring Charges

Restructuring charges were approximately $2.6 million for the three months ended March 31, 2017. Mirna and its landlord entered into a Lease Termination Agreement and Release (the "Lease Settlement") to terminate Mirna's lease of approximately 23,578 square feet of office and laboratory space entered into in June 2016 for consideration of approximately $3.8 million (the "Settlement Amount"). As a result of the Lease Settlement, Mirna recognized incremental contract termination costs based on the Settlement Amount of approximately $2.3 million, which was recorded in restructuring charges during the three months ended March 31, 2017. The remaining restructuring charges primarily related to accrual of retention benefits provided to employees in connection with the reduction in force which took place in November 2016 recognized over the respective employee's service period. There were no restructuring charges during the three months ended March 31, 2016.

Comparison of years ended December 31, 2016 and 2015:

	Year Ended December 31,		Dollar Change	% Change
	2016	2015		
	(in thousands)			
Statement of operations data:				
Operating expenses:				
Research and development, before grant reimbursement	$13,986	$19,405	$(5,419)	(27.9)%
Less grant reimbursement	(56)	(458)	402	(87.8)%
Research and development	13,930	18,947	(5,017)	(26.5)%
General and administrative	8,118	6,080	2,038	33.5%
Restructuring expenses	4,442	—	4,442	100.0%
Loss on Assets	128	—	128	100.0%
Interest income	(350)	(44)	(306)	100.0%
Net loss	$26,268	$24,983	$ 1,285	5.1%

Research and Development Expenses

Research and development expenses were $13.9 million for the year ended December 31, 2016, which was a decrease of $5.0 million, or 27%, compared to research and development expenses of approximately $18.9 million for the year ended December 31, 2015. The decrease in the year ended December 31, 2016 was primarily due to the following:

- A decrease of approximately $6.5 million in general research and development expenses following Mirna's decision to close the Phase 1 study of MRX34 in September 2016 and voluntarily halt the enrollment and dosing of patients in the study and subsequently discontinued further research and development activities. In addition, Mirna incurred certain one-time costs associated with the development and manufacturing of MRX34 during the year ended December 31, 2015, Mirna's only product candidate that was in clinical trials through September 2016.
- An offsetting increase of approximately $1.3 million in employee compensation and benefits due to increased headcount compared to the prior period.

Research and development spending was partially offset by approximately $56,000 of grant reimbursements for the year ended December 31, 2016, compared to reimbursement of approximately $458,000 for the year ended December 31, 2015. The decrease is primarily due to two grants which expired in August 2015 and a third grant expiring in August 2016.

General and Administrative Expenses

General and administrative expenses were approximately $8.1 million for the year ended December 31, 2016, which was an increase of approximately $2.0 million, or 34%, compared to the year ended December 31, 2015. The increase for the year ended December 31, 2015 was primarily due to the following:

- Approximately $1.0 million for additional costs associated with operating as a publicly-traded company, including higher legal, audit, insurance, professional fees and administrative costs.
- Approximately $1.0 million of increased employee compensation, benefits and stock compensation expense due to increased headcount and changes in compensation, of which $455,000 related to increased payroll and benefits expenses and $545,000 related to stock-based compensation expense.

Restructuring Charges

Restructuring charges were approximately $4.4 million for the year ended December 31, 2016. Mirna did not have restructuring charges during the year ended December 31, 2015. On September 20, 2016, Mirna

announced its decision to close the Phase 1 clinical trial of MRX34, voluntarily halted the enrollment and dosing of patients in the study and subsequently discontinued its research and development activities. Following the announcement, Mirna received notice from the FDA that its IND for MRX34 had been placed on full clinical hold. Following Mirna's announcement and notification from the FDA, the Mirna Board of Directors approved a reduction of the total number of full-time employees from 36 to approximately 12. Mirna also committed to retention payments to certain key employees if such employees remained with Mirna until June 30, 2017 or were terminated by Mirna without cause prior to such date. The restructuring expenses recognized during the year ended December 31, 2016 included approximately $1.5 million for employee severance and benefits, $1.5 million for lease facility termination costs, and $1.4 million for non-cash impairment charges of property and equipment. The majority of employee severance and related benefits are expected to be settled in the first quarter of 2017. Mirna expects to incur additional restructuring charges of approximately $0.3 million through the six months ended June 30, 2017.

Comparison of year ended December 31, 2015 and 2014:

	Year Ended December 31, 2015	2014	Dollar Change	% Change
	(in thousands)			
Statement of operations data:				
Operating expenses:				
Research and development, before grant reimbursement	$19,405	$10,626	$ 8,779	82.6%
Less grant reimbursement	(458)	(81)	(377)	465.4%
Research and development	18,947	10,545	8,402	79.7%
General and administrative	6,080	3,369	2,711	80.5%
Write off of offering expenses	—	1,920	(1,920)	(100.0)%
Interest income	(44)	—	(44)	100.0%
Net loss	$24,983	$15,834	$ 9,149	57.8%

Research and Development Expenses

Research and development spending, prior to the offset of grant reimbursements, was $19.4 million for the year ended December 31, 2015, which was an increase of approximately $8.8 million, or 83%, compared to research and development spending, prior to the offset of grant reimbursements, of $10.6 million for the year ended December 31, 2014. After giving effect to the offset of grant reimbursements, research and development expenses were $18.9 million for the year ended December 31, 2015, which was an increase of $8.4 million, or 80%, compared to research and development expenses of approximately $10.5 million for the year ended December 31, 2014. The increase in the year ended December 31, 2015 was primarily due to increased clinical trial costs related to Mirna's Phase 1 clinical trial, including a higher number of patients, additional investigator sites related to the increased trial activity; increased personnel costs due to increases in headcount, and increased intellectual property and licensing costs.

Research and development spending was partially offset by approximately $458,000 of grant reimbursements for the year ended December 31, 2015, compared to reimbursement of approximately $81,000 for the same period in 2014. The increase was due to a higher volume of work being performed on the research funded by the federal grants.

General and Administrative Expenses

General and administrative expenses were approximately $6.1 million for the year ended December 31, 2015, which was an increase of approximately $2.7 million, or 81%, compared to the same period in 2014. General and administrative expenses increased primarily due to increased personnel-related expenses, higher outside professional costs, consulting costs and recruiting costs.

Write-off of Offering Expenses

Mirna deferred costs incurred for a planned IPO through August 2014, which included legal, audit, tax and other professional fees. The IPO was delayed and, as a result, Mirna recorded a write-off of deferred offering costs of $1.9 million during the year ended December 31, 2014. Deferred offering costs incurred through December 31, 2015 have been recorded as a reduction of proceeds from a concurrent private placement and the IPO.

Liquidity and Capital Resources

Liquidity and Capital Expenditures

Since inception, Mirna's operations have been financed primarily through proceeds of $167.3 million, of which approximately $89.9 million was from the issuance of preferred stock for cash and assets, $48.7 million was from a public offering of Mirna Common Stock, $16.8 million was from a private placement of Mirna Common Stock and $11.9 million was from federal and state grants. At March 31, 2017, Mirna had $17.1 million of cash and cash equivalents and $40.4 million invested in marketable securities for a total of $57.5 million in liquid assets. Mirna's primary uses of cash are to fund operating expenses and evaluate strategic alternatives. Cash used to fund operating expenses is impacted by the timing of when Mirna pays these expenses, as reflected in the change in Mirna's outstanding accounts payable and accrued expenses.

Mirna believes that its existing cash, cash equivalents and marketable securities as of March 31, 2017, will be sufficient to meet its anticipated cash requirements for at least the next 12 months. However, Mirna's forecast of the period of time through which its financial resources will be adequate to support its operations is a forward-looking statement that involves risks and uncertainties, and actual results could vary materially.

Mirna's future capital requirements are difficult to forecast and will depend on many factors, including:

- Mirna's ability to complete the Merger or, if the Merger is not completed, identify and consummate another strategic transaction;
- the timing and nature of any other strategic transactions that Mirna undertakes, including but not limited to a potential partnership or business combination;
- Mirna's ability to establish and maintain collaboration partnerships, in-license/out-license or other similar arrangements and the financial terms of such agreements;
- personnel-related expenses, including salaries, benefits, stock-based compensation expense and other compensation costs related to implementing Mirna's restructuring;
- the costs associated with archiving company records related to Mirna's research and development, and general and administrative activities;
- the costs of preparing, filing, and prosecuting patent applications and maintaining, enforcing and defending intellectual property-related claims;
- the extent to which Mirna may elect to resume drug research and development activities in the future, if at all; and
- the cost incurred in responding to disruptive actions by activist stockholders.

In addition, certain executive officers are entitled to certain payments if they are terminated without cause or as a result of a change in control. Upon termination without cause, and not as a result of death or disability, each of such officers is entitled to receive payment of base salary for 9 to 12 months following termination of employment and certain officers will be entitled to continue to receive coverage under medical and dental benefit plans for 9 to 12 months or until such officers are covered under a separate plan from another employer. Upon a termination other than for cause or with good reason following a change in control, each of such officers is

entitled to receive payment of base salary for 12 to 18 months following termination of employment and 100% to 150% of the executive's target bonus paid in a single cash lump sum. In addition, the officers will be entitled to continue to receive coverage under medical and dental benefit plans for 12 to 18 months or until such officers are covered under a separate plan from another employer.

The following table shows a summary of Mirna's cash flows for the three months ended March 31, 2017 and 2016.

	Three Months Ended March 31,	
	2017	2016
	(in thousands)	
Net cash provided by (used in):		
Operating activities	$(3,216)	$ (8,973)
Investing activities	3,880	(27,865)
Financing activities	25	—
Net increase (decrease)	$ 689	$(36,838)

The following table shows a summary of Mirna's cash flows for the years ended December 31, 2016, 2015 and 2014:

	Year Ended December 31,		
	2016	2015	2014
		(in thousands)	
Net cash provided by (used in):			
Operating activities	$(24,805)	$ (21,135)	$(13,970)
Investing activities	(48,491)	(251)	(102)
Financing activities	16	101,780	209
Net increase (decrease)	$(73,280)	$ 80,394	$(13,863)

Operating Activities

Net cash used in operating activities was $3.2 million and $9.0 million for the three months ended March 31, 2017 and 2016, respectively. The decrease in overall spending for operating activities of approximately $5.8 million was due to reduced personnel and operating expenses following the reduction in force and discontinuation of Mirna's research and development activities, which occurred in the fourth quarter of 2016. Excluding the impact of restructuring charges in the three months ended March 31, 2017, Mirna's net loss decreased from $6.5 million to $2.4 million for the months ended March 31, 2016 and 2017, respectively, a decrease of $4.1 million. In addition, Mirna made an up-front licensing payment of $1.6 million reflected in operating activities during the three months ended March 31, 2016.

Net cash used in operating activities was $24.8 million and $21.1 million for the year ended December 31, 2016 and 2015, respectively. The increase in overall spending for operating activities of approximately $3.7 million was due to increased headcount and personnel expenses, increased compliance costs related to operating as a public company for a full year, payment of licensing fees accrued at December 31, 2015, and severance and benefits payments in connection with the workforce reduction initiated by Mirna in November 2016. The increase was partially offset by a decrease in research and development expenditures following Mirna's decision to close the ongoing Phase 1 study of MRX34 in September 2016 and voluntarily halt the enrollment and dosing of patients in the study, as well as discontinuing further research and development activities.

Net cash used in operating activities was $21.1 million and $14.0 million for the years ended December 31, 2015 and 2014, respectively. The increase in overall spending for operating activities of approximately $7.1 million was due to increased headcount and personnel expenses, increased spending for clinical trials and intellectual property related expenses and higher license fees for 2015. The increase was partially offset by the one-time write-off of IPO offering-related costs in August 2014.

Investing Activities

Net cash used in investing activities for the three month periods ended March 31, 2017 and 2016 relates primarily to the purchases and maturities of marketable securities during the three months ended March 31, 2017 and 2016. For the three months ended March 31, 2017, Mirna had net inflows related to marketable securities of $3.6 million, as the maturities of securities exceeded purchases during the period, whereas for the three months ended March 31, 2016, Mirna had net outflows $27.7 million, as it began investing the proceeds from Mirna's IPO during the first quarter of 2016.

Net cash used in investing activities for the years ended December 31, 2016, 2015 and 2014 relates primarily to the purchase of marketable securities during the year ended December 31, 2016. Mirna invested $103.1 million in U.S. treasury, U.S. government agency and corporate debt securities with maturities greater than 90 days using surplus proceeds received in connection with Mirna's IPO and concurrent private placement in October 2015, partially offset by maturities of debt securities during the period of $58.8 million. In addition, Mirna obtained a standby letter of credit of $2.4 million in connection with the lease entered into in June 2016 reflected in calendar year 2016 investing activities as restricted cash.

For the years ended December 31, 2016, 2015, and 2014, total amounts spent on the purchase of fixed assets were approximately $1,729,000, $313,000, and $102,000 respectively.

Financing Activities

Net cash provided by financing activities was approximately $25,000 for the three months ended March 31, 2016 and was $16,000 for the year ended December 31, 2016, which such amounts were attributable to proceeds received from the exercise of stock options.

Net cash provided by financing activities was approximately $101.8 million for the year ended December 31, 2015, which was due to the offering of Mirna's Series D convertible preferred stock, as well as its IPO and concurrent private placement.

For the year ended December 31, 2014 net cash provided by financing activities of $16.4 million was due to the net proceeds from the second funding round of Mirna's Series C convertible preferred stock in December 2013.

Contractual Obligations and Commitments

The following table presents payments due under Mirna's contractual obligations as of March 31, 2017:

		Payments Due by Period			
	Total	Less than 1 Year	1-3 Years	3-5 Years	Over 5 Years
Operating Lease	$ 6,917,376	$ 601,239	$ 1,257,415	$ 1,334,037	$ 3,724,685
Other	32,694	32,694	—	—	—
	$ 6,950,070	$ 633,933	$ 1,257,415	$ 1,334,037	$ 3,724,685

Off-Balance Sheet Arrangements

Mirna did not have during the periods presented, and it does not currently have, any off-balance sheet arrangements, as defined in the rules and regulations of the SEC.

Segment Information

Mirna has one primary business activity and operate as one reportable segment.

JOBS Act

Section 107 of the JOBS Act provides that an emerging growth company can take advantage of the extended transition period provided in Section 7(a)(2)(B) of the Securities Act for complying with new or revised accounting standards. Thus, an emerging growth company can delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. Mirna has irrevocably elected not to avail itself of this extended transition period and, as a result, Mirna will adopt new or revised accounting standards on the relevant dates on which adoption of such standards is required for other companies.

QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT THE MARKET RISK OF MIRNA

The market risk inherent in Mirna's financial instruments and in Mirna's financial position represents the potential loss arising from adverse changes in interest rates. At March 31, 2017, Mirna had cash and cash equivalents of $17.1 million and short-term marketable securities of $40.4 million consisting of interest-bearing money market funds, U.S. treasury securities, U.S. government agency securities, and corporate debt securities. Mirna's primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates. Due to the short-term maturities of Mirna's cash equivalents and marketable securities, as well as the low risk profile of Mirna's investments, Mirna does not believe a change in interest rates would have a material effect on the fair market value of its cash, cash equivalents and marketable securities.

SYNLOGIC MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Forward-Looking Information

You should read the following discussion and analysis of Synlogic's financial condition and results of operations together with the information in the section entitled "*Selected Historical Financial Data of Synlogic*" and Synlogic's financial statements and the notes to those financial statements in this proxy statement/prospectus/information statement. Some of the information contained in this discussion and analysis or set forth elsewhere in this proxy statement/prospectus/information statement, including information with respect to Synlogic's plans and strategy for its business and related financing, includes forward-looking statements that involve risks and uncertainties. As a result of many factors, such as those set forth in the section entitled "Risk Factors" in this proxy statement/prospectus/information statement, Synlogic's actual results may differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Overview

Synlogic is pioneering the development of Synthetic Biotic medicines: a novel class of living medicines intended to treat a broad range of human diseases, ranging from genetic and acquired metabolic disorders to inflammation and cancer. Synthetic Biotic medicines are generated from Synlogic's proprietary drug discovery and development platform. Synlogic applies the principles and tools of synthetic biology to engineer beneficial probiotic bacteria to perform or deliver critical therapeutic functions, compensating for missing or damaged pathways in patients with these serious diseases. As living medicines, Synthetic Biotic medicines are designed to sense a local disease context within a patient's body and to respond by metabolizing toxic substances or delivering combinations of therapeutic factors.

Synlogic's initial focus is on metabolic diseases with the potential to be corrected following oral delivery of a living medicine to the gut. This includes a group of rare genetic diseases called IEMs, as well as acquired metabolic diseases caused by organ dysfunction. Synlogic's approach to selecting its initial programs is based on the potential of the Synthetic Biotic platform to uniquely address conditions in which there is (1) unmet medical need with (2) well understood biology that is (3) based on an imbalance of a metabolite and (4) where that metabolite is available within or originating from the gut lumen. Additional considerations include the availability of animal models, relevant biomarkers and feasible clinical development paths. Synlogic's initial clinical and pre-clinical programs are focused on certain IEMs that share these characteristics. When delivered orally, Synthetic Biotic medicines are designed to act from the gut to compensate for the dysfunctional metabolic pathway with the intended consequence of reducing the levels of the toxic metabolites systematically. Synlogic believes success in IEMs will enable it to demonstrate the potential of its oral Synthetic Biotic medicines to address metabolic dysfunction while bringing meaningful change to lives of patients suffering from these debilitating conditions.

Synlogic initiated a Phase 1 clinical trial for its lead Synthetic Biotic program, SYNB1020, in June 2017. SYNB1020 is in development as an oral treatment for patients with hyperammonemia. In patients with these conditions ammonia accumulates in the body and becomes toxic leading to neurocognitive crisis and risk of long-term cognitive or behavioral impairment, coma or death. Hyperammonemic conditions include UCD (an IEM) and HE in patients with liver disease. Synlogic's second program, SYNB1618, is an oral therapy intended for the treatment of PKU, an IEM in which the amino acid phenylalanine accumulates in the body as a result of genetic defects, becoming toxic to the brain and leading to neurological dysfunction. SYNB1618 is designed to have activity in the gut of patients to reduce excess phenylalanine to result in normalization of levels in the blood and tissues. Synlogic is planning to initiate a Phase 1 clinical trial for SYNB1618 in the first half of 2018. Synlogic's earlier metabolic pipeline includes discovery-stage product candidates for additional IEMs, MSUD, IVA and organic acidemias. Synlogic is also leveraging its proprietary technology platform to develop Synthetic Biotic medicines to treat a broader range of human diseases, including acquired metabolic diseases, inflammation and cancer. Synlogic's portfolio includes additional programs for IBD and immuno-oncology.

Synlogic was incorporated in Delaware as TMC Therapeutics, Inc. on March 14, 2014. On July 15, 2014, TMC Therapeutics, Inc. changed its name to Synlogic, Inc. On July 2, 2015, holders of Synlogic Common Stock and Synlogic Preferred Stock executed the Synlogic, LLC Contribution Agreement (the "Contribution Agreement"), pursuant to which such common and preferred shareholders contributed such shareholders' equity interests in Synlogic in exchange for common and preferred units in a newly formed parent company named Synlogic, LLC (the "2015 Reorganization"). In addition, IBDCo was formed as a subsidiary of Synlogic, LLC, as part of the 2015 Reorganization. In conjunction with the 2015 Reorganization, Synlogic entered into a license, option and merger agreement with AbbVie for the development of treatments for IBD. In May 2017, Synlogic completed a series of transactions pursuant to which Synlogic, LLC merged with an into Synlogic, Inc., which continued to exist as the surviving corporation

Synlogic currently operates in one reportable business segment—the discovery and development of Synthetic Biotic medicines.

To date, Synlogic has dedicated substantially all of its activities to the research and development of its product candidates. Synlogic has received approximately $113.1 million in payments to date as it financed its operations through multiple rounds of preferred equity funding, receipts from a convertible promissory note and payments received under the AbbVie Agreements. Funding rounds include approximately $3.0 million, net of expenses, from the sale of Series A-1 convertible preferred stock in July 2014, approximately $1.0 million, net of expenses, from the sale of contingently redeemable Series A-1 preferred stock in September 2014, approximately $6.9 million, net of expenses, from the sale of Series A-2 convertible preferred stock in May 2015, approximately $1.4 million, net of expenses, from the sale of contingently redeemable Series A-2 convertible preferred stock in May 2015, approximately $0.7 million, net of expenses, from the sale of Class A-2 preferred units in November 2015, approximately $14.5 million, net of expenses, from the sale of Class A-3 preferred united in February 2016, approximately $2.6 million, net of expenses, from the sale of contingently redeemable Class A-3 preferred units in February 2016, approximately $13.6 million, net of expenses, from the sale of Class B preferred units in February 2016, approximately $26.6 million, net of expenses, from the sale of Class B Preferred Units in March 2017 and approximately $40.4 million, net of expenses, from the sale of Series C Convertible Preferred Stock in May 2017. In April 2014, Synlogic entered into an agreement with one of its investors for an approximately $0.4 million convertible promissory note, which was converted into Series A-1 preferred stock in July 2014. In December 2015, Synlogic received $2.0 million from AbbVie as part of Synlogic's collaboration agreement with AbbVie.

Synlogic has not generated any revenue to date from product sales and has incurred significant operating losses since its inception in 2014. Synlogic has incurred net losses of approximately $7.4 million and $3.8 million for the three months ended March 31, 2017 and 2016, respectively and approximately $21.0 million and $8.5 million for the years ended December 31, 2016 and 2015, respectively. As of March 31, 2017, Synlogic had an accumulated deficit of approximately $38.6 million and it expects to incur losses for the foreseeable future as it develops its product candidates. Synlogic expects its expenses and capital requirements will increase substantially in connection with its ongoing activities, as Synlogic:

- completes pre-clinical studies, initiates and completes clinical trials for product candidates;
- contracts to manufacture product candidates;
- advances research and development related activities to expand Synlogic's product pipeline;
- seeks regulatory approval for its product candidates;
- maintains, expands and protects Synlogic's intellectual property portfolio;
- hires additional staff, including clinical, scientific, and management personnel;

- expands its existing infrastructure and secures space in a facility to support continued growth in its research and development efforts; and
- adds operational and finance personnel to support product development efforts and, if the Merger is approved, to support operating as a public company.

Synlogic does not expect to generate product revenue unless and until it successfully completes clinical development and obtains regulatory approvals for its product candidates, either alone or in collaboration with third parties. Additionally, Synlogic expects to utilize third-party CROs to carry out its clinical development activities, and Synlogic does not yet have a commercial organization. If Synlogic obtains regulatory approval for any of its product candidates, it expects to incur significant expenses related to developing its internal commercialization capability to support product sales, marketing and distribution. Accordingly, Synlogic anticipates that it will seek to fund its operations through public or private equity or debt financings, collaborations or licenses, capital lease transactions or other available financing transactions. However, Synlogic may be unable to raise additional funds through these or other means when needed.

Because of the numerous risks and uncertainties associated with product development, Synlogic is unable to predict the timing or amount of increased expenses or when or if it will be able to achieve or maintain profitability. Even if Synlogic is able to generate product revenue, it may not become profitable.

Recent Events

In May 2017, Synlogic completed the Reorganization, pursuant to which Synlogic, LLC merged with and into Synlogic, which continued to exist as the surviving corporation. Pursuant to the Reorganization, the common units and preferred units of Synlogic, LLC, together consisting of Class A Preferred Units, contingently redeemable Class A Preferred Units and Class B Preferred Units were exchanged for Synlogic Common Stock and Synlogic Preferred Stock. The Synlogic Preferred Stock has substantially similar rights and preferences as the preferred units, except that the Synlogic Preferred Stock is convertible into Synlogic Common Stock at the option of the holder, on a one-for-one basis, subject to an antidilution adjustment. Conversion of the Synlogic Preferred Stock is automatically triggered upon a firm-commitment underwritten public offering or upon a supermajority preferred interest vote.

In May 2017, Synlogic replaced the 2015 Equity Incentive Plan with the 2017 Stock Incentive Plan under which it issued restricted common stock awards to replace the cancelled incentive units pursuant to the termination of the 2015 Equity Incentive Plan.

In May 2017, Synlogic sold and issued 5,210,922 shares of Series C preferred stock to investors for total consideration of approximately $40.4 million, net of issuance costs of approximately $1.6 million.

On May 15, 2017, Synlogic entered into the Merger Agreement with Mirna under which Synlogic will merge with a wholly owned subsidiary of Mirna in an all-stock transaction. The Merger remains subject to certain conditions, including the approval of Mirna Stockholders. If approved, upon Closing, Mirna will be renamed Synlogic, Inc.

On May 26, 2017, Synlogic achieved a milestone under the AbbVie Agreements for which it will receive $2.0 million.

Financial Overview

Revenue

All of Synlogic's revenue to date is generated from its collaboration agreement with AbbVie. The collaboration agreement contains multiple deliverables, which include an exclusive option for AbbVie to acquire

IBDCo and research and development milestones. Payments to Synlogic include an upfront payment of $2.0 million received in December 2015 and a milestone payment of $2.0 million in May 2017, and may include up to $14.5 million in additional development milestone payments as well as royalties on product sales and payments upon the achievement of certain regulatory, clinical and commercial milestones and the execution of AbbVie's option to acquire IBDCo. Synlogic expects its revenue to fluctuate for the foreseeable future as its revenue is principally based on the achievement of research and development milestones under its collaboration agreement with AbbVie.

Research and Development Expense

Synlogic's research and development expense consists of expenses incurred in connection with the discovery and development of Synlogic's product candidates, including the conduct of pre-clinical studies and product development and expenses such costs as they are incurred. These expenses consist primarily of:

- compensation, benefits and other employee related expenses;
- supplies to support Synlogic's internal research and development efforts;
- research and development related facility and depreciation costs; and
- third-party contract costs relating to research, process development, pre-clinical studies and regulatory operations.

Synlogic's two lead therapeutic programs are being developed for the treatment of IEMs, UCD and PKU. There is unmet need to improve current therapies for both indications and an opportunity to reduce toxic metabolites that originate from the gut. Both also inform the potential of the Synthetic Biotic platform in unique ways. Synlogic's lead product candidate, SYNB1020, is designed as an oral therapy to remove excess ammonia from the blood by accessing ammonia in the lower GI tract and converting it into arginine, a natural amino acid used in normal growth and metabolism. The conversion of ammonia into arginine is based on enhancing an enzyme pathway endogenous to *E. coli* Nissle. The program has clinical application in that multiple disease indications involve toxic ammonia levels. In addition to UCD, Synlogic is exploring SYNB1020 to treat hyperammonemia in patients with HE secondary to chronic liver disease to stave off episodes of cognitive dysfunction. SYNB1020 has also received orphan drug designation for UCD from the FDA. Synlogic initiated a Phase 1 clinical trial of SYNB1020 in healthy volunteers in June 2017. Assuming success in this study, Synlogic plans to initiate studies in UCD and HE to better understand the safety and tolerability of SYNB1020 in patients. Synlogic's second IEM program, SYNB1618 for PKU, is designed to act in the upper GI tract to reduce excess phenylalanine in the blood by transforming it into non-toxic metabolites. Synlogic expects to initiate a Phase 1 clinical trial for this program in the first half of 2018.

Synlogic's earlier-stage IEMs portfolio includes Synthetic Biotic programs for (1) MSUD and IVA and (2) PA and MMA. These are rare metabolic deficiencies in which the toxic accumulation of leucine and organic acids, respectively, can lead to neurological decline and death. There are no currently approved therapies for these disorders, and patients with such disorders are left to rely on liver transplants when possible. Synlogic believes that developing therapies for this group of rare diseases will demonstrate the potential of its oral Synthetic Biotic medicines to address metabolic dysfunction, while bringing meaningful change to lives of patients suffering from these debilitating conditions. Synlogic is also leveraging its proprietary technology platform to develop Synthetic Biotic medicines to treat a broader range of human diseases, including acquired metabolic diseases, inflammation and cancer. Synlogic's portfolio includes additional programs for IBD and immuno-oncology.

The lengthy process of securing regulatory approvals for new drugs requires the expenditure of substantial resources. Any failure by Synlogic to obtain, or any delay in obtaining, regulatory approvals would materially adversely affect its product candidate development efforts and its business overall. Given the inherent uncertainties that come with the development of pharmaceutical products, Synlogic cannot estimate with any

degree of certainty how these programs will evolve, and therefore the amount of time or money that would be required to obtain regulatory approval and to market its product candidates. As a result of these uncertainties surrounding the timing and outcome of any approvals, Synlogic is currently unable to estimate precisely, when, if ever, its product candidates will generate revenues and cash flows.

Synlogic invests carefully in its pipeline, and the commitment of funding for each subsequent stage of its development programs is dependent upon the receipt of clear, supportive data. Synlogic expects costs associated with its SYNB1020 and SYNB1618 programs to increase as the programs progress toward and into clinical trials.

The successful development of Synlogic's product candidates is highly uncertain and subject to a number of risks including, but not limited to:

- the duration of clinical trials may vary substantially according to the type, complexity and novelty of the product candidate;
- the FDA and comparable agencies in foreign countries impose substantial requirements on the introduction of therapeutic pharmaceutical products, typically requiring lengthy and detailed laboratory and clinical testing procedures, sampling activities and other costly and time-consuming procedures;
- data obtained from pre-clinical and clinical activities at any step in the testing process may be adverse and lead to discontinuation or redirection of development activity. Data obtained from these activities also are susceptible to varying interpretations, which could delay, limit or prevent regulatory approval;
- the duration and cost of discovery, pre-clinical studies and clinical trials may vary significantly over the life of a product candidate and are difficult to predict;
- the costs, timing and outcome of regulatory review of a product candidate may not be favorable; and
- the emergence of competing technologies and products and other adverse market developments may negatively impact Synlogic.

As a result of the uncertainties discussed above, Synlogic is unable to determine the duration and costs to complete current or future pre-clinical and clinical stages of development of its product candidates or when, or to what extent, Synlogic will generate revenues from the commercialization and sale of its product candidates. Development timelines, probability of success and development costs vary widely. Synlogic anticipates that it will make determinations as to which additional programs to pursue and how much funding to direct to each program on an ongoing basis in response to the scientific and clinical data of each product candidate, as well as the competitive landscape and ongoing assessments of such product candidate's commercial potential.

Synlogic expects its research and development costs will be substantial for the foreseeable future. Synlogic will continue to invest in its product candidates as it advances those product candidates through pre-clinical studies and clinical trials.

Synlogic tracks direct research and development expenses, consisting principally of external costs, such as costs associated with clinical research organizations and manufacturing of pre-clinical and clinical drug product and other outsourced research and development expenses to specific product programs. Costs related to specific product candidates are tracked upon the selection of a product candidate. Synlogic does not allocate employee and consulting related costs, costs associated with its platform and facility expenses, including depreciation or other indirect costs, to specific product candidate programs because these costs are deployed across multiple product candidate programs under research and development and, as such, are separately classified. The table below summarizes Synlogic's research and development expenses by categories of costs for the periods presented (in thousands):

	Years Ended December 31,		Three Months Ended March 31,	
	2016	2015	2017	2016
SYNB1020	$ 2,317	$ —	$ 992	$ 100
SYNB1618	—	—	110	—
External pre-development candidate expenses and unallocated expenses	5,527	1,562	1,680	848
Internal research and development expenses	7,166	2,462	2,336	1,376
	$15,010	$4,024	$5,118	$2,324

General and Administrative Expense

Synlogic's general and administrative expense consists primarily of compensation, benefits and other employee-related expenses for personnel in Synlogic's administrative, finance, legal, information technology, business development and human resource functions. Other costs include the legal costs of pursuing patent protection of Synlogic's intellectual property, general and administrative related facility and information technology infrastructure costs and professional fees for accounting and legal services. Synlogic anticipates increases in expenses related to operating as a public company. These increases include legal fees, accounting fees, costs for director and officer liability insurance, fees for investor relations services and costs associated with implementing and complying with corporate governance, internal controls and similar requirements applicable to public companies. Synlogic charges all general and administrative expenses to operations as incurred.

Critical Accounting Policies and Estimates

Synlogic's discussion and analysis of its financial condition and results of operations is based upon its consolidated financial statements prepared in accordance with U.S. GAAP. The preparation of these financial statements requires Synlogic to make certain estimates and assumptions that affect the reported amounts of assets and liabilities, the reported amounts of revenues and expenses during the reported periods and related disclosures. These estimates and assumptions, including those related to revenue recognition and equity-based compensation, are monitored and analyzed by Synlogic for changes in facts and circumstances, and material changes in these estimates could occur in the future. These critical estimates and assumptions are based on Synlogic's historical experience, its observance of trends in the industry, and various other factors that are believed to be reasonable under the circumstances and form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from Synlogic's estimates under different assumptions or conditions.

Synlogic believes that its application of the following accounting policies, each of which require significant judgments and estimates on the part of management, are the most critical to aid in fully understanding and evaluating its reported financial results. Synlogic's significant accounting policies are more fully described in Note 2, *Summary of Significant Accounting Policies*, to its consolidated financial statements appearing elsewhere in this proxy statement/prospectus/information statement.

Revenue Recognition

Synlogic generates revenue through its collaboration agreement with AbbVie for the development and commercialization of product candidates. The terms of this agreement include payment to Synlogic of one or more of the following: nonrefundable, up-front license fees; milestone payments; and royalties on product sales.

Synlogic recognizes revenue for each unit of accounting when there is persuasive evidence that an arrangement exists, delivery has occurred or services have been rendered, the price is fixed or determinable, and collectability is reasonably assured.

Synlogic records amounts it receives prior to satisfying the revenue recognition criteria as deferred revenue in its consolidated balance sheets. Amounts expected to be recognized as revenue within the 12 months following the balance sheet date are classified as current deferred revenue. Amounts not expected to be recognized as revenue within the 12 months following the balance sheet date are classified as deferred revenue, net of current portion.

When Synlogic evaluates revenue from agreements, it considers the nature and contractual terms of the arrangement and the nature of its business operations to determine the classification of the transactions. When Synlogic is an active participant in the activity and exposed to significant risks and rewards dependent on the commercial success of the collaboration, it will record transactions on a gross basis in the consolidated financial statements and describe the rights and obligations under the collaborative arrangement in the notes to the consolidated financial statements.

Multiple-Element Arrangements

Synlogic evaluates revenue from agreements that have multiple elements and determines whether the individual deliverables have value on a stand-alone basis and represent separate units of accounting or whether they must be accounted for as a combined unit of accounting. Synlogic accounts for those deliverables as separate elements when: (i) the delivered item(s) has value to the customer on a stand-alone basis and (ii) if the arrangement includes a general right of return relative to the delivered item(s), delivery or performance of the undelivered item(s) is considered probable and substantially within Synlogic's control.

The determination that multiple elements in an arrangement meet the criteria for separate units of accounting requires Synlogic to exercise its judgement. Synlogic considers such factors as the research, manufacturing and commercialization capabilities of the collaboration partner; Synlogic's retention of any key rights; and the availability of the associated expertise in the general marketplace. In addition, Synlogic considers whether the collaboration partner can use the other deliverable(s) for their intended purpose without the receipt of the remaining element(s), whether the value of the deliverable is dependent on the undelivered item(s) and whether there are other vendors that can provide the undelivered element(s).

In situations where Synlogic has identified multiple units of accounting, the arrangement consideration that is fixed or determinable is allocated among the separate units of accounting using the relative selling price method. Synlogic determines the estimated selling price for units of accounting within each arrangement using vendor-specific objective evidence ("VSOE") of selling price, if available; third-party evidence ("TPE") of selling price if VSOE is not available; or best estimate of selling price ("BESP") if neither VSOE nor TPE is available. Synlogic then determines the appropriate period and pattern of recognition. Synlogic recognizes as revenue, upon delivery, arrangement consideration attributed to deliverables that have stand-alone value from the other deliverables to be provided in an arrangement. For deliverables that do not have stand-alone value from the other deliverables to be provided in an arrangement, Synlogic recognizes revenue over the estimated performance period, as the arrangement would be accounted for as a single unit of accounting.

If there is no discernible pattern of performance and/or objectively measurable performance measures do not exist, then Synlogic recognizes revenue under the arrangement for the single unit of accounting on a straight-line

basis over the period it expects to complete its performance obligations. Alternatively, if the pattern of performance in which the service is provided to the customer can be determined and objectively measurable performance measures exist, then Synlogic recognizes revenue under the arrangement using the proportional performance method. Revenue recognized is limited to the lesser of the cumulative amount of payments received or the cumulative amount of revenue earned, as determined using the straight-line method or proportional performance method, as applicable.

Milestones

Contingent consideration from research and development activities that is earned upon the achievement of a substantive milestone is recognized in its entirety in the period in which the milestone is achieved. At the inception of an arrangement that includes milestone payments, Synlogic evaluates whether each milestone is substantive and at risk to both parties on the basis of the contingent nature of the milestone. This evaluation includes an assessment of whether: (i) the consideration is commensurate with either Synlogic's performance to achieve the milestone or the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting from Synlogic's performance to achieve the milestone, (ii) the consideration relates solely to past performance and (iii) the consideration is reasonable relative to all of the deliverables and payment terms within the arrangement. Synlogic uses considerable judgement and evaluates factors such as the scientific, clinical, regulatory, commercial and other risks that must be overcome to achieve the respective milestone and the level of effort and investment required to achieve the respective milestone in making the assessment whether a milestone is substantive. Assuming all other revenue recognition criteria are met, Synlogic recognizes revenue associated with substantive milestones upon successful accomplishment of each milestone and it recognizes revenue for milestones that are not considered substantive over the remaining period of performance. To date, Synlogic has recognized one substantive milestone under its AbbVie collaboration agreement.

Payments received or reasonably assured after performance obligations are fully met are recognized as earned. Because the recognition of a substantive milestone under a collaboration agreement typically requires the completion of a number of activities conducted over a significant period of time, the expenses related to achieving the milestone often are incurred prior to the period in which the milestone payment is recognized. When Synlogic does achieve milestones that it considers substantive under its collaboration, Synlogic may experience significant fluctuations in its revenue from quarter to quarter and year to year depending on the timing of achieving such substantive milestones.

Up-Front License Fees

Synlogic recognizes revenues from a nonrefundable, up-front license fee related to its collaboration and license agreements, representing the $2.0 million under the AbbVie collaboration agreement, on a straight-line basis over the period of performance or option period, which closely aligns with the continued involvement in research and development. The period of performance over which the revenues are recognized is the period over which the option can be exercised, which is tied to the research and development efforts. As a result, Synlogic often is required to make estimates regarding drug development and commercialization timelines for compounds being developed pursuant to a collaboration or license agreement. Because the drug development process is lengthy and Synlogic's collaboration and license agreements typically cover activities over several years, this approach has resulted in the deferral of revenue into future periods. In addition, because of the many risks and uncertainty associated with the development of drug candidates, Synlogic's estimates regarding the period of performance may change in the future. Any change in Synlogic's estimates could result in substantial changes to the period over which the revenues from an up-front license fee are recognized. To date, Synlogic has had no material changes to its estimated period of continuing involvement under its AbbVie collaboration agreement.

Equity-based Compensation Expense

Synlogic has issued stock options, incentive units, restricted stock awards and restricted common unit awards at various points in its history, depending on its corporate organizational structure.

Synlogic measures equity-based compensation to employees and directors based on the grant date fair value of the awards, net of estimated forfeitures, and recognizes the associated expense in the consolidated financial statements over the requisite service period of the award, which is generally the vesting period.

Equity-based compensation costs for nonemployee awards are recognized as services are provided, which is generally the vesting period, on a straight-line basis. The measurement date for nonemployee awards is generally the date the performance of services required from the nonemployee is complete. Synlogic believes that the fair value of the equity is more reliably measurable than the fair value of the services rendered. The fair value of the award granted to a nonemployee is remeasured at each reporting date until performance is completed with any increase or decrease in fair value recorded as equity-based compensation expense.

Synlogic records the expense for equity grants subject to performance-based milestone vesting over the remaining service period when it determines that achievement of the milestone is probable. Management evaluates when the achievement of a performance-based milestone is probable based on the relative satisfaction of the performance conditions as of the reporting date.

The Black-Scholes option-pricing model, and the Black Scholes with barrier option pricing model for incentive units, requires the use of highly subjective assumptions to estimate the fair value of equity-based awards. If Synlogic had made different assumptions, equity-based compensation expense, net loss and net loss per common unit could have been significantly different. These assumptions include:

- Fair value of Synlogic Common Stock: because Synlogic Common Stock is not yet publicly traded, Synlogic must estimate its fair value.
- Threshold price of Synlogic, LLC's incentive units: Synlogic determines the price at which an incentive unit would have a liquidation value of zero at the date of grant in setting the threshold price for incentive units.
- Expected volatility: As Synlogic does not have a trading history for Synlogic Common Stock, the expected stock price volatility for Synlogic Common Stock was based on an average of the historical volatility of a peer group of similar public companies based on daily price observations over a period equivalent to the expected term of the equity award. Industry peers consist of several public companies in the biopharmaceutical industry that are similar in size, stage of life cycle and financial leverage. Synlogic did not rely on implied volatilities of traded options in its industry peers' common stock because the volume of activity was relatively low. Synlogic intends to continue to consistently apply this process using the same or similar public companies until a sufficient amount of historical information regarding the volatility of Synlogic Common Stock price becomes available, or unless circumstances change such that the identified companies are no longer similar to Synlogic, in which case, more suitable companies whose share prices are publicly available would be utilized in the calculation.
- Expected term: Synlogic does not believe it is able to rely on its historical exercise and post-vesting termination activity to provide accurate data for estimating the expected term for use in estimating the fair value-based measurement of its equity awards. Therefore, Synlogic has opted to use the "simplified method" for estimating the expected term of its stock options. Since its incentive units do not have an expiration date, Synlogic uses a probability-weighted estimated term to a liquidity event.
- Risk-free rate: The risk-free interest rate is based on the yields of U.S. Treasury securities with maturities similar to the expected term at the time of grant.
- Expected dividend yield: Synlogic has never declared or paid any cash dividends and does not presently plan to pay cash dividends in the foreseeable future. Consequently, Synlogic used an expected dividend yield of zero.

The estimated fair value of Synlogic Common Stock underlying Synlogic Options and the estimated threshold price for incentive units issued by Synlogic, LLC were determined at each grant date by the Synlogic Board of Directors.

The Synlogic Board of Directors determined the estimated per share fair value of Synlogic Common Stock at various dates considering contemporaneous valuations performed in accordance with the guidance outlined in the American Institute of Certified Public Accountants Practice Aid, *Valuation of Privately-Held Company Equity Securities Issued as Compensation*. The fair value of Synlogic Common Stock was determined by the Synlogic Board of Directors at each award grant date based on assumptions, each of which are subjective and generally require judgement and estimation by management, including results obtained from independent third party valuations, Synlogic's financial position and historical financial performance, the status of technological developments within Synlogic's products, the composition and ability of the current research and management team, an evaluation or benchmark of Synlogic's competition, the current business climate in the marketplace, the illiquid nature of Synlogic Common Stock, arm's length sales of Synlogic Capital Stock (including convertible preferred stock), the effect of the rights and preferences of the Synlogic Preferred Stock, and the prospects of a liquidity event. The Synlogic Board of Directors determined the threshold price for an incentive unit, which is the price at which an incentive unit would have a liquidation value of zero, considering the fair value of Synlogic LLC's assets and performing an analysis to determine the per unit amount that a holder would receive upon a distribution event. In determining the fair value of Synlogic LLC's assets, Synlogic relied on independent third-party valuations, which take into account a variety of factors, including its financial position and historical financial performance, the status of technological developments within its products, the composition and ability of the current research and management team, an evaluation or benchmark of its competition, the current business climate in the marketplace, the illiquid nature of Synlogic Common Stock and incentive units, arm's-length sales of Synlogic's equity, the effect of the rights and preferences of the preferred unit holders, and the prospects of a liquidity event, among others.

Results of Operations

The following discussion summarizes the key factors Synlogic's management believes are necessary for an understanding of its consolidated financial results.

Three Months Ended March 31, 2017 Compared to Three Months Ended March 31, 2016

	Three Months Ended March 31,	
	2017	2016
	(in thousands)	
Revenue	$ 111	$ 111
Operating expenses:		
Research and development	5,118	2,324
General and administrative	2,367	1,613
Total operating expenses	7,485	3,937
Loss from operations	(7,374)	(3,826)
Interest income (expense), net	6	(2)
Net loss	$(7,368)	$(3,828)

Revenue

	Three Months Ended March 31,		Change	
	2017	2016	$	%
	(dollars in thousands)			
Revenue	$ 111	$ 111	$—	0%

Revenue was the same for the three months ended March 31, 2017 and the three months ended March 31, 2016 and was due to the revenue recognized associated with the AbbVie collaboration agreement. Research and

development efforts related to the collaboration began in 2016 and the revenue recognized is associated with the amortization of the upfront, nonrefundable $2.0 million payment received in 2015. The payment is amortized over the expected period AbbVie's option can be exercised, which is closely tied to the period in which the research and development services are provided.

Operating Expenses

	Three Months Ended March 31,		Change	
	2017	2016	$	%
	(dollars in thousands)			
Operating expenses:				
Research and development	$5,118	$2,324	$2,794	120%
General and administrative	2,367	1,613	754	47%
Total operating expenses	$7,485	$3,937	$3,548	90%

Research and Development Expense

The increase in research and development expense of approximately $2.8 million for the three months ended March 31, 2017 compared to the three months ended March 31, 2016 was primarily the result of an increase in external research and development costs of approximately $1.8 million associated with pre-clinical studies, process development, consulting and other costs associated with Synlogic's external studies designed to advance the development of its product candidates. Increases of approximately $0.7 million were associated with compensation, benefits and other employee-related expenses associated with increased headcount. An increase of approximately $0.1 million was associated with research and development support costs, including increased rent and depreciation from Synlogic's 200 Sidney Street facility, which it occupied in February 2016.

General and Administrative Expense

The increase in general and administrative expense of approximately $0.8 million for the three months ended March 31, 2017 compared to the three months ended March 31, 2016 was primarily the result of an increase in corporate and patent legal related expenses of approximately $0.4 million related to legal fees associated with patent filings and fees related to Synlogic's corporate transactions, such as the Reorganization and the Merger. Other increases include an increase of approximately $0.3 million associated with compensation, benefits and other employee related expenses associated with increased headcount.

Interest Income (Expense), Net

	Three Months Ended March 31,		Change	
	2017	2016	$	%
	(dollars in thousands)			
Interest income (expense), net	$ 6	$ (2)	$8	400%

The increase in interest income (expense), net of approximately $8,000 for the three months ended March 31, 2017 compared to the three months ended March 31, 2016 was related to an increase in interest income resulting from an interest-bearing account that was set up in September 2016.

Year Ended December 31, 2016 Compared to Year Ended December 31, 2015

	Years Ended December 31, 2016	2015
	(in thousands)	
Revenue	$ 444	$ —
Operating expenses:		
Research and development	15,010	4,024
General and administrative	6,398	4,500
Total operating expenses	21,408	8,524
Loss from operations	(20,964)	(8,524)
Interest income (expense), net	10	(8)
Net loss	$ (20,954)	$ (8,532)

Revenue

	Years Ended December 31, 2016	2015	Change $	%
	(dollars in thousands)			
Revenue	$444	$—	$444	100%

The increase in revenue for the year ended December 31, 2016 compared to the year ended December 31, 2015 of approximately $0.4 million was due to the revenue recognized associated with the AbbVie collaboration agreement. Work related to the collaboration began in 2016 and the revenue recognized is associated with the amortization of the upfront, nonrefundable $2.0 million payment received in December 2015. This payment is amortized over the expected period the option can be exercised, which is closely tied to the period in which the research and development services are provided.

Operating Expenses

	Years Ended December 31, 2016	2015	Change $	%
	(dollars in thousands)			
Operating expenses:				
Research and development	$15,010	$4,024	$10,986	273%
General and administrative	6,398	4,500	1,898	42%
Total operating expenses	$21,408	$8,524	$12,884	151%

Research and Development Expense

The increase in research and development expense of approximately $11.0 million for the year ended December 31, 2016 compared to the year ended December 31, 2015 was primarily the result of an increase in external research and development costs of approximately $6.3 million associated with pre-clinical studies, process development, consulting and other costs associated with Synlogic's external studies designed to advance the development of its product candidates. Increases of approximately $2.7 million were associated with compensation, benefits and other employee-related expenses associated with increased headcount. Increases of approximately $1.1 million were associated with research and development support costs, including increased rent and depreciation from Synlogic's 200 Sidney Street facility, which it occupied in February 2016. Increases of approximately $0.4 million were associated with recruiting new employees.

General and Administrative Expense

The increase in general and administrative expense of approximately $1.9 million for the year ended December 31, 2016 compared to the year ended December 31, 2015 was primarily the result of an increase of approximately $1.2 million in compensation, benefits and other employee-related expenses associated with increased headcount and an increase in severance costs of approximately $0.4 million associated with the certain organizational changes. Other increases were associated with increased professional services and temporary help.

Interest Income (Expense), Net

	Years Ended December 31,		Change	
	2016	2015	$	%
	(dollars in thousands)			
Interest income (expense), net	$ 10	$ (8)	$18	225%

The increase in interest income (expense), net of approximately $18,000 for the year ended December 31, 2016 compared to the year ended December 31, 2015 was related to an increase in interest income resulting from an interest-bearing account that was set up in September 2016.

Liquidity and Capital Resources

Synlogic has incurred losses since its inception on March 14, 2014 and, as of March 31, 2017, it had an accumulated deficit of approximately $38.6 million. Synlogic has financed its operations to date primarily through the sale of Synlogic Preferred Stock, Synlogic Common Stock and preferred units, payments received under Synlogic's AbbVie collaboration agreement and interest earned on investments. At March 31, 2017, Synlogic had approximately $34.1 million in cash.

During the three months ended March 31, 2017, Synlogic's cash balance increased approximately $19.6 million. The increase was primarily due to the proceeds of approximately $26.6 million from the sale of Series B preferred units partially offset by the cash used to operate Synlogic's business, including payments related to, among other things, research and development and general and administrative expenses as Synlogic continued to invest in its primary drug candidates and support the development of its proprietary platform. Synlogic also made capital purchases and made payments on its capital leases.

During the year ended December 31, 2016, Synlogic's cash balance increased approximately $8.4 million. This increase was primarily due to approximately $30.7 million in net proceeds from the sale of Class A and B preferred units in February 2016. This source of cash was partially offset by the cash used to operate Synlogic's business, including payments related to, among other things, research and development and general and administrative expenses as Synlogic continued to invest in its primary drug candidates and support the development of its proprietary platform. Synlogic also made capital purchases and made payments on its capital leases.

The following table sets forth the major sources and uses of cash for each of the periods set forth below (in thousands):

	Years Ended December 31,		Three Months Ended March 31,	
	2016	2015	2017	2016
Net cash (used in) provided by:				
Operating activities	$(20,408)	$(5,044)	$ (6,904)	$ (4,736)
Investing activities	(1,833)	(501)	(125)	(665)
Financing activities	30,648	8,925	26,589	30,822
Net increase in cash:	$ 8,407	$ 3,380	$19,560	$25,421

Cash Flows from Operating Activities

Net cash used in operating activities totaled approximately $6.9 million for the three months ended March 31, 2017. The primary uses of cash were Synlogic's net loss of approximately $7.4 million. These uses of cash were partially offset by an increase of approximately $0.1 million in working capital primarily from decreases in prepaid expenses and other current assets and non-cash items of approximately $0.4 million.

Net cash used in operating activities totaled approximately $4.7 million for the three months ended March 31, 2016. The primary uses of cash were Synlogic's net loss of approximately $3.8 million and a decrease of approximately $1.1 million in working capital primarily from increases in prepaid expenses and other current assets and accounts payable and accrued expenses. These uses of cash were partially offset by non-cash items of approximately $0.2 million.

Net cash used in operating activities totaled approximately $20.4 million for the year ended December 31, 2016. The primary uses of cash were Synlogic's net loss of approximately $21.0 million and a decrease of approximately $0.5 million in working capital primarily from reductions in deferred revenue as revenue was recognized from its collaboration agreement with AbbVie. These uses of cash were partially offset by non-cash items of approximately $1.1 million.

Net cash used in operating activities totaled approximately $5.0 million for the year ended December 31, 2015. The primary use of cash resulted from Synlogic's net loss of approximately $8.5 million. This use of cash was partially offset by non-cash items of approximately $0.3 million and an increase of approximately $3.2 million in working capital, primarily from increases in deferred revenue associated with Synlogic's collaboration agreement with AbbVie and increases in accounts payable and accrued expenses.

Cash Flows from Investing Activities

Cash used in investing activities for the three months ended March 31, 2017 totaled approximately $0.1 million and resulted primarily from the purchase of property and equipment.

Cash used in investing activities for the three months ended March 31, 2016 totaled approximately $0.7 million and resulted primarily from the purchase of property and equipment.

Cash used in investing activities for the year ended December 31, 2016 totaled approximately $1.8 million and resulted primarily from the purchase of property and equipment.

Cash used in investing activities for the year ended December 31, 2015 totaled approximately $0.5 million and resulted primarily from the purchase of property and equipment.

Cash Flows from Financing Activities

Cash provided by financing activities for the three months ended March 31, 2017 totaled approximately $26.6 million and resulted primarily from the net proceeds of the sale of Class B preferred units in March 2017 of approximately $26.6 million. This source of cash was partially offset by payments on Synlogic's capital leases.

Cash provided by financing activities for the three months ended March 31, 2016 totaled approximately $30.8 million and resulted primarily from the net proceeds of the sale of Class A preferred units, contingently redeemable Class A preferred units and Class B preferred units in February 2016 of approximately $14.5 million, $2.6 million and $13.6 million, respectively. This source of cash was partially offset by payments on Synlogic's capital leases.

Cash provided by financing activities for the year ended December 31, 2016 totaled approximately $30.6 million and resulted primarily from the net proceeds of the sale of Class A preferred units, contingently

redeemable Class A preferred units and Class B preferred units in February 2016 of approximately $14.5 million, $2.6 million and $13.6 million, respectively. This source of cash was partially offset by payments on Synlogic's capital leases of approximately $0.1 million.

Cash provided by financing activities for the year ended December 31, 2015 totaled approximately $8.9 million and resulted primarily from the net proceeds of the sale of Series A preferred stock, contingently redeemable Series A preferred stock and Class A preferred units of approximately $6.9 million, $1.4 million and $0.7 million, respectively. This source of cash was partially offset by payments on Synlogic's capital lease of approximately $0.1 million.

Funding Requirements

To date, Synlogic has not commercialized any products and has not achieved profitability. Synlogic anticipates that it will continue to incur substantial net losses for the next several years as it further develops its product candidates, invests in its proprietary platform technology and operates as a publicly traded company.

Synlogic has generated revenue from an up-front license fee, but has not generated any product revenue since its inception and does not expect to generate any product revenue unless it receives regulatory approval for its product candidates. Synlogic believes that its cash on hand as of March 31, 2017, additional cash raised in May 2017 through the sale of its Series C preferred stock and additional cash it may receive as a result of the Merger transaction, as well as additional milestone payments from its current and future collaborators, will be sufficient to meet its anticipated cash requirements for at least the next 12 months. Synlogic's forecast of the period of time through which its financial resources will be adequate to support its operations is a forward-looking statement that involves risks and uncertainties, and actual results could vary materially and negatively as a result of a number of factors, including the factors discussed in the section entitled "*Risk Factors*" in this proxy statement/prospectus/information statement. Synlogic has based its estimates on assumptions that may prove to be wrong, and it could utilize its available capital resources sooner than it currently expects.

Due to the numerous risks and uncertainties associated with the development of Synlogic's product candidates, it is unable to estimate precisely the amounts of capital outlays and operating expenditures necessary to complete the development of and to obtain regulatory approval for its product candidates. Synlogic's funding requirements will depend on many factors, including, but not limited to, the following:

- the initiation, progress, timing, costs and results of clinical trials for its product candidates;
- the time and costs involved in obtaining regulatory approvals for its product candidates;
- the rate of progress and cost of its commercialization activities;
- the success of its research and development efforts;
- the expenses it incurs in marketing and selling its product candidates;
- the revenue generated by sales of its product candidates;
- the emergence of competing or complementary technological developments;
- the costs of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights;
- the terms and timing of any additional collaborative, licensing or other arrangements that it may establish;
- the acquisition of businesses, products and technologies;
- its need to implement additional infrastructure and internal systems; and

- its need to add personnel and financial and management information systems to support its product development and potential future commercialization efforts, and to enable it to operate as a public company.

As an early stage company, Synlogic is subject to a number of risks common to other life science companies, including, but not limited to, raising additional capital, development by its competitors of new technological innovations, risk of failure in pre-clinical studies, safety and efficacy of its product candidates in clinical trials, the regulatory approval process, market acceptance of Synlogic's products once approved, lack of marketing and sales history, dependence on key personnel and protection of proprietary technology. Synlogic's therapeutic programs are currently pre-commercial, spanning discovery through early development and will require significant additional research and development efforts, including extensive pre-clinical and clinical testing and regulatory approval, prior to commercialization of any product candidates. These efforts require significant amounts of additional capital, adequate personnel infrastructure and extensive compliance-reporting capabilities. There can be no assurance that Synlogic's research and development will be successfully completed, that adequate protection for its intellectual property will be obtained, that any products developed will obtain necessary regulatory approval or that any approved products will be commercially viable. Even if Synlogic's product development efforts are successful, it is uncertain when, if ever, it will generate revenue from product sales. Synlogic may never achieve profitability, and unless and until it does, it will continue to need to raise additional capital or obtain financing from other sources, such as strategic collaborations or partnerships. If Synlogic cannot expand its operations or otherwise capitalize on its business opportunities because it lacks sufficient capital, its business, financial condition and results of operations could be materially adversely affected.

Contractual Commitments and Obligations

As Synlogic recently entered the clinic for its first Phase 1 clinical trial, it expects its most significant clinical trial expenditures will be with CROs and CMOs. These contracts generally are cancellable, with notice, at Synlogic's option and do not have cancellation penalties. These items are not included in the table below.

The following table summarizes Synlogic's contractual obligations at December 31, 2016 (excluding interest):

	Payments due by period				
	Total	Less than 1 year	1-3 years	3-5 years	More than 5 years
Capital lease obligations	$ 380	$ 203	$ 177	$—	$ —
Operating lease obligations	4,312	946	3,013	353	—
Total contractual obligations	$4,692	$1,149	$3,190	$353	$ —

The commitment for capital lease obligations relates to leased lab equipment.

The commitments for operating leases relate to Synlogic's lease of office and laboratory space at 200 Sidney Street in Cambridge, Massachusetts, which it occupied in February 2016. The lease, which expires in April 2021, provides for annual rent of approximately $0.9 million and will increase annually by 3%.
During the three months ended March 31, 2017, there were no material changes to Synlogic's contractual obligations.

Related Party Transactions

Synlogic contracted services from one of its principal investors for its former president and chief executive officer and former chief medical officer, who were both employed by the principal investor, as well as employed

to support separate portfolio companies of the investor. Synlogic paid a separate portfolio company approximately $0.1 million relating to reimbursement for a portion of the salary of Synlogic's former chief medical officer for the year ended December 31, 2016 and $0.1 million relating to reimbursement for a portion of the salary of Synlogic's former chief executive officer and chief medical officer during the year ended December 31, 2015. During the three months ended March 31, 2017, Synlogic did not make any payments of this nature and it paid approximately $38,000 during the three months ended March 31, 2016.

Synlogic contracted the services of The Orphan Group which specializes in supporting biotechnology companies in developing therapeutics toward diseases of high unmet medical needs in rare disorders. The Orphan Group is owned by Synlogic's former chief operating officer. Synlogic paid The Orphan Group approximately $13,000 and approximately $15,000 for contracted services in the years ended December 31, 2016 and 2015, respectively. During the three months ended March 31, 2017, Synlogic did not make any payments to The Orphan Group and it paid approximately $9,000 during the three months ended March 31, 2016.

In September 2016, Synlogic issued a loan to its president and chief executive officer of approximately $0.2 million. The loan was repaid in June 2017, including interest which accrued at a rate of 0.6%.

Please see the section entitled "*Related Party Transactions of Directors and Executive Officers of the Combined Organization—Synlogic Transactions*" for additional Synlogic transactions with related parties which may fall outside of the reporting period of this section.

Off-Balance Sheet Arrangements

Synlogic does not have any relationships with unconsolidated entities or financial partnerships, such as entities often referred to as structured finance or special purpose entities, that would have been established for the purpose of facilitating off-balance sheet arrangements (as that term is defined in Item 303 (a)(4)(ii) of Regulation S-K) or other contractually narrow or limited purposes. As such, Synlogic is not exposed to any financing, liquidity, market or credit risk that could arise if it had engaged in those types of relationships. Synlogic enters into guarantees in the ordinary course of business related to the guarantee of its performance and the performance of its subsidiaries.

New Accounting Pronouncements

From time to time, new accounting pronouncements are issued by the Financial Accounting Standards Board (the "FASB") or other standard setting bodies that are adopted by Synlogic as of the specified effective date. Unless otherwise discussed, Synlogic believes that the impact of recently issued standards that are not yet effective will not have a material impact on its consolidated financial position or results of operations upon adoption.

Recently Issued Accounting Standards

In May 2014, the FASB issued ASU 2014-09—*Revenue from Contracts with Customers (Topic 606)*, which supersedes all existing revenue recognition requirements, including most industry-specific guidance. This standard is based on the principle that an entity should recognize revenue when it transfers goods or services to customers in an amount that reflects the consideration that Synlogic expects to receive. This standard also requires additional disclosure about the nature, amount, timing and uncertainty of assets recognized from costs incurred to fulfill a contract. It will be effective for annual reporting periods beginning after December 15, 2017, including interim periods within those annual periods. Early adoption is permitted any time after the original effective date, which for Synlogic, is January 1, 2017. Entities have the option of using either a full retrospective or a modified retrospective approach for the adoption of the new standard. Synlogic is currently assessing the impact that this standard will have on its financial statements and the expected method of transition.

In August 2014, the FASB issued ASU 2014-15—*Presentation of Financial Statements—Going Concern* ("ASU 2014-15") on disclosure of uncertainties about an entity's ability to continue as a going concern. This guidance addresses management's responsibility in evaluating whether there is substantial doubt about a company's ability to continue as a going concern and to provide related footnote disclosures. The guidance is effective for fiscal years ending after December 15, 2016 and for annual periods and interim periods thereafter, with early adoption permitted. Synlogic adopted ASU 2014-15 as of December 31, 2016 and it did not have a material effect on its consolidated financial statements.

In February 2015, the FASB issued ASU 2015-02, *Consolidation (Topic 810)* ("ASU 2015-02") to address financial reporting considerations for the evaluation as to the requirement to consolidate certain legal entities. This standard is effective for fiscal years and for interim periods within those fiscal years beginning after December 15, 2015. Synlogic has evaluated the impact of ASU 2015-02 and has concluded that it has no effect on its consolidated financial statements.

In November 2015, the FASB issued ASU 2015-17—*Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes*, which provides guidance on the presentation of deferred income taxes that requires deferred tax assets and liabilities, along with related valuation allowances, to be classified as noncurrent on the balance sheet. As a result, each tax jurisdiction will now only have one net noncurrent deferred tax asset or liability. The new guidance does not change the existing requirement that prohibits offsetting deferred tax liabilities from one jurisdiction against deferred tax assets of another jurisdiction. The new guidance is effective for financial statements issued for annual periods beginning after December 15, 2016, and interim periods within those annual periods, with early application permitted. The amendments may be applied either prospectively to all deferred tax liabilities and assets or retrospectively to all periods presented. Synlogic does not expect the adoption of this standard to have a material impact on its financial statements.

In February 2016, the FASB issued ASU 2016-02—*Leases (Topic 84)*, which replaces the existing accounting guidance for leases. This standard requires entities that lease assets to recognize the assets and liabilities for the rights and obligations created by those leases on the balance sheet. The standard is effective for fiscal years and the interim periods within those fiscal years beginning after December 15, 2018. The guidance is required to be applied by the modified retrospective transition approach and early adoption is permitted. Synlogic is currently assessing the impact that adoption of this guidance will have on its financial statements and footnote disclosures.

In March 2016, the FASB issued ASU 2016-09—*Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting* ("ASU 2016-09"). The amendments in ASU 2016-09 are to simplify several aspects of the accounting for stock-based payment transactions including the income tax consequences, classification of awards as either equity or liabilities, and classification on the statement of cash flows. The amendments are effective for interim and annual reporting periods beginning after December 15, 2016. Synlogic does not expect the adoption of this standard to have a material impact on its financial statements.

In November 2016, the FASB issued ASU 2016-18—*Statement of Cash Flows (Topic 230): Restricted Cash* ("ASU 2016-19"), which requires companies to include cash and cash equivalents that have restrictions on withdrawal or use in total cash and cash equivalents on the statement of cash flows. This ASU is effective for public business entities for annual and interim periods in fiscal years beginning after December 15, 2017. Synlogic is currently assessing the impact of ASU 2016-18 on its financial statements and related disclosures.

QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT THE MARKET RISK OF SYNLOGIC

The primary objective of Synlogic's investment activities is to preserve capital for the purpose of funding operations, while at the same time maximizing the income it receives from investments without materially increasing risk. To achieve these objectives, Synlogic's investment policy allows it to maintain a portfolio of cash, cash equivalents and short-term investments in a variety of securities, including commercial paper and money market funds. Cash at March 31, 2017 consisted exclusively of cash in bank accounts. Synlogic does not currently hedge interest rate exposure. Because Synlogic holds its cash in bank accounts, it does not believe that an increase or decrease in market rates would have a material impact on it. While Synlogic does not believe that its cash and restricted cash contain excessive risk, Synlogic cannot provide absolute assurance that in the future its investments will not be subject to adverse changes in market value. Synlogic maintains significant amounts of cash and restricted cash at one or more financial institutions that are in excess of federally insured limits.

MANAGEMENT FOLLOWING THE MERGER

Executive Officers and Directors

Resignation of Current Executive Officers of Mirna

Pursuant to the Merger Agreement, all of the current executive officers of Mirna will resign immediately prior to the completion of the Merger.

Executive Officers and Directors of the Combined Organization Following the Merger

The Mirna Board of Directors is currently composed of seven directors. Pursuant to the Merger Agreement, all of the current directors of Mirna, other than two designees selected by Mirna to remain on the Mirna Board of Directors, shall resign from the Mirna Board of Directors at or prior to the Effective Time. The two directors designated by Mirna will then elect, effective as of the Effective Time, four designees selected by Synlogic, each to serve as members of the Mirna Board of Directors in staggered classes to be agreed upon by Mirna and Synlogic prior to the Effective Time (provided that Michael Powell, Ph.D. shall be appointed to the class whose term expires in 2020).

Following the consummation of the Merger, it is anticipated that the Mirna Board of Directors will have one vacancy which will be filled by a Synlogic designated director, pursuant to the Merger Agreement.

Following the consummation of the Merger, the management team of Mirna is expected to be composed of the management team of Synlogic. The following table lists the names and ages as of May 31, 2017 and positions of the individuals who are expected to serve as executive officers and directors of Mirna upon completion of the Merger:

Name	Age	Position(s)
Executive Officers		
Jose Carlos Gutierrez-Ramos, Ph.D.	54	President and Chief Executive Officer; Class I Director
Todd Shegog	52	Chief Financial Officer
Aoife Brennan, MB, BCh, BAO, MMSc	42	Chief Medical Officer
Paul Miller, Ph.D.	57	Chief Scientific Officer
Richard Schwartz, Ph.D.	58	Senior Vice President of Process Development and Manufacturing
Caroline B. Kurtz, Ph.D.	53	Head of Translational Sciences and Product Development
Non-Employee Directors		
Peter Barrett, Ph.D.	64	Class II Director; Chairman of Board of Directors
Chau Khuong	41	Class III Director
Nick Leschly	45	Class III Director
Edward Mathers	57	Class II Director
Michael Powell, Ph.D.	62	Class II Director

Executive Officers

Jose Carlos Gutierrez-Ramos, Ph.D. joined Synlogic as President and Chief Executive Officer in May 2015 and has also served as a director since such time. Dr. Gutierrez-Ramos served as President from May 2015 to September 2015 and from December 2016 to the present. Dr. Gutierrez-Ramos has served as Chief Executive Officer since May 2015. Dr. Gutierrez-Ramos joined Synlogic from Pfizer, a biopharmaceutical company, where he served as Group Senior Vice President and global head of BioTherapeutics Research from 2009 to May 2015. In that role, Dr. Gutierrez-Ramos held responsibility for more than 25 novel programs across the full spectrum of clinical development, re-launched efforts in Rare Disease Discovery and Development and founded the Centers

for Therapeutic Innovation. Dr. Gutierrez-Ramos oversaw and enhanced the biologics platform for Pfizer from early discovery to entry in manufacturing. From 2007 to 2009, Dr. Gutierrez-Ramos held the position of Senior Vice President and Head of the Immuno-inflammation Center for Drug Discovery (iiCEDD) at GlaxoSmithKline, a pharmaceutical company, where he founded entrepreneurial units such as Epinova and Tempero focused in translating novel areas of science (e.g. Epigenetics and Tregs) into therapeutics. From 1995 to 2007, Dr. Gutierrez-Ramos was Senior Vice President and Head of Research & Development at Avidia Inc., a biopharmaceutical company, and Peptimmune Inc., a biotechnology company, where he led significant efforts focused on the discovery of novel protein therapeutics and peptides for autoimmune disease, including multiple sclerosis and diabetes. Dr. Gutierrez-Ramos began his career in the drug industry at Millennium Pharmaceuticals, a biopharmaceutical company, serving as Vice President of Inflammation Drug Discovery. In that capacity, Dr. Gutierrez-Ramos was responsible for advancing pre-clinical candidates in inflammation and immunology into human clinical trials and advancing compounds (small molecules and antibodies) from discovery through clinical development. Dr. Gutierrez-Ramos began his career in academia as part of the faculty at the Genetics department of Harvard Medical School. Dr. Gutierrez-Ramos was also a member of the Basel Institute for Immunology in Basel, Switzerland, and a fellow at the Max-Plank Institute in Freiburg, Germany. Dr. Gutierrez received a M.S. in Biochemistry and Molecular Biology and a Ph.D. in Immunology from Universidad Autónoma de Madrid.

Todd Shegog joined Synlogic in September 2016 as Chief Financial Officer and is responsible for the oversight and direction of Synlogic's financial strategy and management as well as facilities and information systems. From April 2014 to August 2016, Mr. Shegog served as senior vice president and chief financial officer at Forum Pharmaceuticals Inc., a pharmaceutical company, where he was responsible for finance, operations and information systems in support of the pursuit of innovative therapies for schizophrenia and Alzheimer's disease. From 1998 to March 2014, Mr. Shegog was Senior Vice President and Chief Financial Officer of Millennium Pharmaceuticals where he was responsible for management of Synlogic's financial resources, corporate planning, financial reporting and compliance. During his tenure at Millennium Pharmaceuticals, Mr. Shegog held key leadership roles supporting the early evolution of Synlogic and its transformation from a genomics company to a fully-integrated drug developer, the approval and launch of its flagship oncology product, VELCADE®, and the $8.8 billion acquisition of Millennium Pharmaceuticals by Takeda Pharmaceutical Co Ltd. Mr. Shegog began his career in healthcare at Genetics Institute, Inc. (now Pfizer), a biotechnology research and development company, in a variety of financial positions supporting its research and development organizations and was a member of the commercial operations team that supported the launch of BeneFIX®. Mr. Shegog holds an M.B.A. from the Tepper School of Management at Carnegie Mellon University and a bachelor's degree in electrical engineering from Lafayette College.

Aoife M. Brennan, MB, BCh, BAO, MMSc joined Synlogic in September 2016 as Chief Medical Officer and is responsible for the oversight and direction of Synlogic's clinical development strategy and operations. From 2011 to August 2016, Dr. Brennan was Vice President and Head of the Rare Disease Innovation Unit at Biogen, a biotechnology company, where she was responsible for research and development of the Biogen rare disease portfolio, which involved programs ranging from pre-clinical to commercial, including the approval of ALPROLIX™, ELOCTATE™ and SPINRAZA™. From 2008 to 2011, Dr. Brennan was director of clinical development at Tolerx, Inc., a start-up biotechnology company focusing on immunotherapy for Type 1 diabetes. Dr. Brennan holds a medical degree from Trinity College in Dublin, Ireland and completed post-graduate training in internal medicine, endocrinology and metabolism. Dr. Brennan also completed post-doctoral training in clinical research and metabolism at the Beth Israel Deaconess Medical Center in Boston and is a graduate of the Harvard Medical School Scholars in Clinical Science Program.

Paul Miller, Ph.D. joined Synlogic in September 2014 as Chief Scientific Officer and is accountable for all aspects of discovery research and platform expansion at Synlogic. From 2011 to September 2014, Dr. Miller was Vice President of Infection Biology at AstraZeneca, a biopharmaceutical company, where he was responsible for the early discovery portfolio and strategy while also leading several external collaborations. Prior to AstraZeneca, Dr. Miller led various aspects of antibacterials research at Pfizer, a biopharmaceutical company,

beginning in 1997 and became Chief Scientific Officer for antibacterial research from 2008 to 2011, leading discovery teams that produced eight drug development candidates, provided critical research support for several successful marketed antibiotics including Zithromax and Zyvox, and also successfully advanced a novel oxazolidinone (sutezolid) for tuberculosis into Phase 2 studies. A microbial geneticist by training, Dr. Miller began his professional career at the Warner-Lambert Company ("Warner-Lambert"), a pharmaceutical company that merged with Pfizer in 2000, where he integrated modern molecular-genetic approaches into a traditional antibacterial drug discovery program and established novel target discovery projects. Dr. Miller's work at Warner-Lambert led to new insights into the mechanisms by which bacteria sense and respond to antibiotics and other environmental agents. Dr. Miller received a Ph.D. in microbiology and immunology from the Albany Medical College, and conducted post-doctoral studies at NIH. Dr. Miller has also served as a member of the Institute of Medicine's Forum on Microbial Threats and as a grant reviewer to the Bill & Melinda Gates Foundation and the European Union's Innovative Medicines Initiative.

Richard Schwartz, Ph.D. joined Synlogic in September 2016 as senior vice president of process development and manufacturing, where he is responsible for the oversight and management of process development and manufacturing of Synlogic's product candidates. From 2008 to September 2016, Dr. Schwartz was Chief of the Vaccine Production Program at the Vaccine Research Center (the "VRC") at NIH's National Institute of Allergy and Infectious Disease. At the VRC, Dr. Schwartz was responsible for development and clinical production of vaccines against viruses which include HIV, Ebola, Zika, Influenza, Chikungunya and Equine Encephalitis, as well as the first broadly neutralizing monoclonal antibody against HIV. Dr. Schwartz was previously Senior Director of process and manufacturing sciences at MedImmune (formerly Aviron until its acquisition by MedImmune in 2002) from 1999 to 2008, where he was responsible for vaccine development and clinical manufacturing of new vaccine candidates, as well as for providing support to commercial vaccine manufacturing operations. Additionally, Dr. Schwartz was team lead for a Biomedical Advanced Research and Development Authority (BARDA)-funded development effort to convert FluMist® from an egg-based to a cell culture-based production process. Dr. Schwartz received a B.S., M.S. and Ph.D. in Chemical Engineering from the University of Michigan.

Caroline Kurtz, Ph.D. joined Synlogic in October 2016 as Senior Vice President and head of translational sciences and is responsible for all aspects of nonclinical development for Synlogic's therapeutic programs. From July 2004 to September 2016, Dr. Kurtz held roles of increasing responsibility and was most recently Vice President and GC-C Platform Lead at Ironwood Pharmaceuticals, Inc., a pharmaceutical company, where she drove the development of linaclotide (LINZESS®) from pre-IND through NDA approval and life-cycle management. In this role, Dr. Kurtz managed the linaclotide development collaborations with U.S. partner Forest Laboratories, Inc. (now Allergan plc), European partner Almirall, S.A. and Japanese partner Astellas Pharma Inc. Dr. Kurtz also served as Portfolio Lead for the discovery and development of new GC-C agonists, including identification of two additional clinical candidates. From 1995 to 2004, Dr. Kurtz served as Director of Infectious Diseases at Genzyme Corporation (formerly GelTex Pharmaceuticals, Inc. until its acquisition by Genzyme Corporation in 2000), a biotechnology company, where she led discovery of novel polymeric compounds as anti-infectives for intestinal infections such as C. difficile colitis and pulmonary infections, such as Pseudomonas aeruginosa. Dr. Kurtz received a Ph.D. in Immunology from Harvard University and completed her post-doctoral training at the University of Utah.

Non-Employee Directors

Peter Barrett, Ph.D. has served as Chairman of the Synlogic Board of Directors since March 2014. Dr. Barrett joined Atlas Venture L.P., an early-stage venture capital fund, in 2002, and currently serves as a Partner in the life sciences group. From 1998 to 2002, Dr. Barrett was Executive Vice President and Chief Business Officer of Celera Genomics Group (now Celera Corporation, a subsidiary of Quest Diagnostics), a biotechnology company, which he co-founded. From 1979 to 1998, Dr. Barrett held senior management positions at Perkin-Elmer Corporation (now PerkinElmer, Inc.), a technology company focused on human and environmental health, most recently serving as Vice President, Corporate Planning and Business Development.

Dr. Barrett currently serves on the boards of directors of PerkinElmer, Inc., Zafgen, Inc. and several privately held companies. Dr. Barrett previously served on the boards of directors of SciClone Pharmaceuticals, Inc., a pharmaceutical company, from April 2011 to June 2013, Helicos BioSciences Corporation, a life science company, from 2003 to August 2012 and Vitae Pharmaceuticals, Inc., a pharmaceutical company, from December 2004 to May 2015. Dr. Barrett is currently Vice Chairman of the advisory council of the Barnett Institute of Chemical and Biological Analysis at Northeastern University, as well as Adjunct Professor at the Barnett Institute. He is a member of the research council at Boston Children's Hospital. Dr. Barrett holds a B.S. in Chemistry from Lowell Technological Institute (now the University of Massachusetts, Lowell) and a Ph.D. in Analytical Chemistry from Northeastern University. He also completed Harvard Business School's Management Development Program.

Dr. Barrett's qualifications to sit on the Mirna Board of Directors include his extensive leadership, executive, managerial and business experience with life sciences companies, including experience in the formation, development and business strategy of multiple start-up companies in the life sciences sector.

Chau Khuong has served on the Synlogic Board of Directors since February 2016. Mr. Khuong has worked at OrbiMed Advisors LLC, a private equity and venture capital firm, since 2003 and is Private Equity Partner. Mr. Khuong gained experience in start-up operations and business development at Veritas Medicine, Inc., a healthcare company, and in basic science research at the Yale School of Medicine and Massachusetts General Hospital. Mr. Khuong currently serves as a director of several public and private companies, including Aerpio Therapeutics, Inspire Medical Systems, Nabriva Therapeutics AG, NextCure, Inc., Pieris Pharmaceuticals, Inc., ReViral Ltd. and Graybug, Inc. Mr. Khuong previously served as a director of Otonomy, Inc. from August 2013 through July 2016. Mr. Khuong holds a B.S. in Molecular, Cellular and Developmental Biology with concentration in biotechnology and an M.P.H. with concentration in infectious diseases, both from Yale University.

Mr. Khuong's qualifications to sit on the Mirna Board of Directors include his experience as an investor, particularly with respect to healthcare companies, and his broad life sciences industry knowledge. Mr. Khuong also has extensive experience overseeing the operations and research and development of biotechnology companies.

Nick Leschly has served on the Synlogic Board of Directors since March 2016. Mr. Leschly has served as the President and Chief Executive Officer of bluebird bio, Inc. ("bluebird bio"), a clinical-stage biotechnology company, since September 2010. Previously, Mr. Leschly served as Interim Chief Executive Officer of bluebird bio from March 2010 to September 2010. Formerly a partner of Third Rock Ventures, L.P. ("Third Rock"), a venture capital firm, since its founding in 2007, Mr. Leschly played an integral role in the overall formation, development and business strategy of several of Third Rock's portfolio companies, including Agios Pharmaceuticals, Inc. and Edimer Pharmaceuticals, Inc. Prior to joining Third Rock, Mr. Leschly worked at Millennium Pharmaceuticals, leading several early-stage drug development programs and served as the product and alliance leader for VELCADE. Mr. Leschly also founded and served as Chief Executive Officer of MedXtend Corporation, a medical device company. Mr. Leschly received his B.S. in Molecular Biology from Princeton University and his M.B.A. from the Wharton School of Business.

Mr. Leschly's qualifications to sit on the Mirna Board of Directors include his experience in the venture capital industry and drug research and development.

Edward Mathers has served on the Synlogic Board of Directors since July 2014 and on the Mirna Board of Directors since October 2012. Since 2008, Mr. Mathers has been a Partner at NEA, a private venture capital firm focusing on technology and healthcare investments. Mr. Mathers serves on the board of directors of the following pharmaceutical companies: Amplyx Pharmaceuticals, Inc., ObsEva SA, , Ziarco Group Limited, Envisia Therapeutics, Inc., Ra Pharmaceuticals, Inc., Rhythm Pharmaceuticals, and Lumos Pharma. Mr. Mathers also serves on the board of directors of Liquidia Technologies, a biotechnology company. From 2002 to 2008,

Mr. Mathers served as Executive Vice President, Corporate Development and Venture at MedImmune, ts, a biopharmaceutical company, and led its venture capital subsidiary, MedImmune Ventures, Inc. Before joining MedImmune in 2002, Mr. Mathers was Vice President, Marketing and Corporate Licensing and Acquisitions at Inhale Therapeutic Systems, a biotechnology company. Previously, Mr. Mathers spent 15 years at Glaxo Wellcome, Inc. (GlaxoSmithKline), a pharmaceutical company, where he held various sales and marketing positions. Mr. Mathers received a B.S. in Chemistry from North Carolina State University.

Mr. Mathers's qualifications to sit on the Mirna Board of Directors include his experience with the healthcare and pharmaceutical industries and his broad management experience.

Michael Powell, Ph.D. has served as Chairman of the Mirna Board of Directors since October 2012. Since 1997, Dr. Powell has been a General Partner of Sofinnova Ventures, a venture capital firm. Previously, Dr. Powell has held positions at Genentech, Inc., a biotechnology company, Cytel Inc., a research and development company, and Syntex Research Group, a pharmaceutical company. Dr. Powell is currently a director of biopharmaceutical companies Dauntless Pharmaceuticals, Inc., Alvine Pharmaceuticals, Inc., Ascenta Therapeutics, Inc., Checkmate Pharmaceuticals, Inc., Dauntless 1, Inc. and Ocera Therapeutics, Inc. Dr. Powell is an Adjunct Professor at the University of Kansas. Dr. Powell is the Board President of the AIDS Vaccine Advocacy Coalition and serves on the advisory board of the Institute for the Advancement of Medical Innovation at the University of Kansas. Dr. Powell received a B.S. in Chemistry from Scarborough College, a Ph.D. in Physical Chemistry from the University of Toronto and completed his post-doctorate work in Bioorganic Chemistry at the University of California.

Dr. Powell's qualifications to sit on the Mirna Board of Directors include his experience with the life sciences and pharmaceutical industries and the venture capital industry.

Composition of the Board of Directors

The Mirna Board of Directors is currently comprised of seven directors divided into three staggered classes, each class serving three-year terms. The staggered structure of the Mirna Board of Directors will remain in place following completion of the Merger. At the most recent annual meeting of Mirna Stockholders held in 2016, Class I directors were elected. As a result, the term of the Class I directors of the combined organization will expire upon the election and qualification of successor directors at the annual meeting of stockholders in 2019, with the terms of the Class II directors and Class III directors expiring upon the election and qualification of successor directors at the annual meetings of stockholders to be held in 2017 and 2018, respectively.

The director classes for the Mirna Board of Directors are currently as follows:

- Class I directors: Matthew Winkler, Ph.D., Peter S. Greenleaf and Perry Nisen, M.D., Ph.D.;
- Class II directors: Lawrence M. Alleva and Michael Powell, Ph.D.; and
- Class III directors: Paul Lammers, M.D., M.Sc. and Edward Mathers.

Pursuant to the Merger Agreement, each of the directors and officers of Mirna who will not continue as directors or officers of Mirna or the combined organization following the consummation of the Merger shall resign immediately prior to the Effective Time. Pursuant to the terms of the Merger Agreement, five of the directors on the Mirna Board of Directors will be designated by Synlogic and two of such directors will be designated by Mirna. Effective as of the Effective Time, it is anticipated that Mr. Mathers and Dr. Powell. will remain on the Mirna Board of Directors. Then, Mr. Mathers and Dr. Powell will elect Dr. Barrett, Mr. Khuong, Mr. Leschly, Mr. Gutierrez-Ramos and a fifth appointee designated by Synlogic to the Mirna Board of Directors.

It is anticipated that these directors will be appointed to the three staggered director classes of the combined organization's board of directors as follows:

- Class I directors (expiring in 2019): Jose Carlos Gutierrez-Ramos, Ph.D. and Synlogic Designee;

- Class II directors (expiring in 2020): Peter Barrett, Ph.D., Edward Mathers and Michael Powell, Ph.D.; and
- Class III directors (expiring in 2018): Chau Khuong and Nick Leschly.

The division of Mirna's Board of Directors into three classes with staggered three-year terms may delay or prevent a change of management or a change of control of Mirna, or, following the completion of the Merger, the combined organization.

There are no family relationships among any of Mirna's current directors and executive officers, and there are no family relationships among any of the combined organization's proposed directors and executive officers.

Committees of the Board of Directors

The Mirna Board of Directors currently has, and after completion of the Merger the Mirna Board of Directors will continue to have, an Audit Committee, a Compensation Committee and a Nominating and Corporate Governance Committee.

Audit Committee

The purpose of the audit committee is to oversee Mirna's accounting and financial reporting processes and audits of its financial statements. Although management has primary responsibility for the system of internal controls and the financial reporting process, the responsibilities of the audit committee include:

- appointing the independent registered public accounting firm;
- evaluating the independent registered public accounting firm's qualifications, independence and performance;
- determining the engagement of the independent registered public accounting firm;
- reviewing and approving the scope of the annual audit and the audit fee;
- discussing with management and the independent registered public accounting firm the results of the annual audit and the review of quarterly financial statements;
- approving the retention of the independent registered public accounting firm to perform any proposed permissible non-audit services;
- monitoring the rotation of partners of the independent registered public accounting firm on the engagement team as required by law;
- responsibility for reviewing the financial statements and management's discussion and analysis of financial condition and results of operations to be included in annual and quarterly reports to be filed with the SEC;
- reviewing critical accounting policies and estimates; and
- annually reviewing the audit committee charter and the committee's performance.

The audit committee of the combined organization is expected to retain these duties and responsibilities following completion of the Merger.

Following completion of the Merger, the members of the Audit Committee are expected to be Dr. Barrett, Dr. Powell and a third member to be designated by Synlogic who is expected to serve as the chairman of the committee and its financial expert under the rules of the SEC. To qualify as independent to serve on the combined organization's audit committee, the listing standards of the NASDAQ Global Market and the

applicable rules of the SEC require that a director not accept any consulting, advisory or other compensatory fee from the combined organization, other than for service as a director, or be an affiliated person of the combined organization. Mirna and Synlogic believe that, following completion of the Merger, the composition of the audit committee will comply with the applicable requirements of the rules and regulations of NASDAQ and the SEC.

Compensation Committee

The compensation committee reviews and recommends policies relating to compensation and benefits of Mirna's officers and employees. The compensation committee reviews and recommends corporate goals and objectives relevant to the compensation of Mirna's chief executive officer and other executive officers, evaluates the performance of these officers in light of those goals and objectives and recommends to the Mirna Board of Directors the compensation of these officers based on such evaluations. The compensation committee also recommends to the Mirna Board of Directors the issuance of stock options and other awards under Mirna's stock plans. The compensation committee will review and evaluate, at least annually, the performance of the compensation committee and its members, including compliance by the compensation committee with its charter.

Under the compensation committee's charter, it has the authority, in its sole discretion, to retain (or obtain the advice of) any compensation consultant, legal counsel or other adviser to assist it in the performance of its duties. The compensation committee also has the direct responsibility for the appointment, compensation and oversight of the work of any advisers retained or engaged by the compensation committee. Under its charter, the compensation committee also has the authority to delegate its authority and responsibilities to members of the committee or a subcommittee. Finally, the compensation committee has the sole authority to approve the fees and the other terms and conditions of the engagement of any such advisor. Mirna must provide for appropriate funding, as determined by the compensation committee, for the payment of reasonable compensation to any such adviser retained by the compensation committee.

The compensation committee of the combined organization is expected to retain these duties and responsibilities following completion of the Merger.

Following the consummation of the Merger, the members of the compensation committee are expected to be Mr. Mathers, who is expected to serve as chairman, Mr. Leschly and Mr. Khuong. To qualify as independent to serve on the combined organization's compensation committee, the listing standards of the NASDAQ Global Market require a director not to accept any consulting, advisory, or other compensatory fee from the combined organization, other than for service on the combined organization's board of directors, and that the combined organization's board of directors consider whether a director is affiliated with the combined organization and, if so, whether such affiliation would impair the director's judgment as a member of the combined organization's compensation committee. Mirna and Synlogic believe that, after the completion of the Merger, the composition of the compensation committee will meet the requirements for independence under, and the functioning of such compensation committee will comply with any applicable requirements of the rules and regulations of NASDAQ and the SEC.

Nominating and Corporate Governance Committee

The nominating and corporate governance committee is responsible for making recommendations to the Mirna Board of Directors regarding candidates for directorships and the size and composition of the Mirna Board of Directors. In addition, the nominating and corporate governance committee is responsible for overseeing Mirna's corporate governance policies and reporting and making recommendations to the Mirna Board of Directors concerning governance matters.

In evaluating the suitability of individual candidates (both new candidates and current members), the Nominating and Corporate Governance Committee and the Mirna Board of Directors may take into account many factors, including the following:

- personal and professional integrity;

- ethics and values;
- experience in corporate management, such as serving as an officer or former officer of a publicly held company;
- experience in the industries in which Mirna competes;
- experience as a board member or executive officer of another publicly held company;
- diversity of expertise and experience in substantive matters pertaining to Mirna's business relative to other board members;
- conflicts of interest; and
- practical and mature business judgment.

The nominating and governance committee of the combined organization is expected to retain these responsibilities following completion of the Merger.

Following the closing of the Merger, the members of the nominating and governance committee are expected to be Dr. Powell, who is expected to serve as chairman, Dr. Barrett and Mr. Khuong. Mirna and Synlogic believe that, after the completion of the Merger, the composition of the nominating and governance committee will meet the requirements for independence under, and the functioning of such nominating and governance committee will comply with any applicable requirements of the rules and regulations of NASDAQ.

RELATED PARTY TRANSACTIONS OF DIRECTORS AND EXECUTIVE OFFICERS OF THE COMBINED ORGANIZATION

Described below are any transactions occurring since January 1, 2016 as to Mirna, any transactions occurring since inception on March 14, 2014 as to Synlogic, and any currently proposed transactions as to Mirna and Synlogic, to which either Mirna or Synlogic was a party and in which:

- the amounts involved exceeded or will exceed $120,000; and
- a director, executive officer, holder of more than 5% of the outstanding capital stock of Mirna or Synlogic, or any member of such person's immediate family, had or will have a direct or indirect material interest.

In addition to the transactions described below, please see the compensation agreements and other arrangements described under the sections entitled "*Mirna Directors, Officers and Corporate Governance—Director Compensation*," "*Mirna Executive Compensation*," *"Synlogic Executive Compensation"* and *"Synlogic Director Compensation"* in this proxy statement/prospectus/information statement.

Mirna Transactions

Indemnification Agreements

Mirna has entered into indemnification agreements with each of its directors and executive officers. These agreements, among other things, require Mirna to indemnify each director and executive officer to the fullest extent permitted by Delaware law, including indemnification of expenses such as attorneys' fees, judgments, penalties fines and settlement amounts incurred by the director or executive officer in any action or proceeding, including any action or proceeding by or in right of Mirna, arising out of the person's services as a director or executive officer.

Change of Control and Severance Benefits Agreements

See the section entitled "*The Merger—Interests of the Mirna Directors and Executive Officers in the Merger—Change in Control Severance Agreements*" in this proxy statement/prospectus/information statement.

Policies and Procedures for Related Party Transactions

The Mirna Board of Directors has adopted a written related person transaction policy setting forth the policies and procedures for the review and approval or ratification of related person transactions. This policy covers, with certain exceptions set forth in Item 404 of Regulation S-K under the Securities Act, any transaction, arrangement or relationship, or any series of similar transactions, arrangements or relationships in which Mirna was or is to be a participant, where the amount involved exceeds $120,000 and a related person had or will have a direct or indirect material interest, including, without limitation, purchases of goods or services by or from the related person or entities in which the related person has a material interest, indebtedness, guarantees of indebtedness and employment by Mirna of a related person. In reviewing and approving any such transactions, Mirna's audit committee is tasked to consider all relevant facts and circumstances, including, but not limited to, whether the transaction is on terms comparable to those that could be obtained in an arm's length transaction with an unrelated third party and the extent of the related person's interest in the transaction.

Synlogic Transactions

Other than the compensation agreements and other arrangements described under the sections entitled *"Synlogic Executive Compensation"* and *"Synlogic Director Compensation"* in this proxy statement/prospectus/information statement and the transactions described below, since the inception of Synlogic on March 14, 2014,

there has not been and there is not currently proposed, any transaction or series of similar transactions to which Synlogic was, or will be, a party in which the amount involved exceeded, or will exceed, $120,000 and in which any director, executive officer, holder of five percent or more of any class of Synlogic Capital Stock or any member of the immediate family of, or entities affiliated with, any of the foregoing persons, had, or will have, a direct or indirect material interest.

Private Placements of Securities

Note Purchase Agreement

In April 2014, Atlas Venture Fund IX, L.P. ("Atlas Venture Fund IX"), entered into a note purchase agreement (the "Atlas Note Purchase Agreement"), with Synlogic whereby Atlas Venture Fund IX received the right to purchase up to $950,000 in convertible notes from Synlogic. At the only closing pursuant to the Atlas Note Purchase Agreement, held in April 2014, Atlas Venture Fund IX purchased a note (the "Atlas Note"), in the principal amount of $350,000 with an interest rate of five percent per annum. The principal amount and accrued interest on the Atlas Note was eligible for conversion into Synlogic's preferred stock at a 10 percent discount on the per-share purchase price for such preferred stock at Synlogic's first qualified preferred stock financing, as defined in the Atlas Note Purchase Agreement. The Atlas Note was converted to Series A-1 preferred stock at the initial closing of the Series A preferred stock financing, as described below.

Series A Preferred Stock Financing of Synlogic, Inc.

In July 2014, in connection with its Series A preferred stock financing, Synlogic entered into a stock purchase agreement, (the "Series A Purchase Agreement"), among Atlas Venture Fund IX and New Enterprise Associates 14, L.P. ("NEA 14"), pursuant to which Synlogic agreed to issue and sell an aggregate of (i) 1,325,702 shares of Series A-1 preferred stock at a purchase price of $2.75 per share for aggregate consideration of $3,645,488, as well as 143,158 shares of Series A-1 preferred stock issuable upon conversion of the Atlas Note in the amount of $354,315 (including a principal amount of $350,000 and accrued interest of $4,315) at $2.475 per share (representing a 10 percent discount on the Series A-1 purchase price); (ii) 1,714,284 shares of Series A-2 preferred stock at a purchase price of $3.50 per share for aggregate consideration of $5,999,994; (iii) 1,604,166 shares of Series A-3 preferred stock at a purchase price of $4.00 per share for aggregate consideration of $6,416,664; and (iv) 2,363,635 shares of Series A-4 preferred stock at a purchase price of $5.50 per share for aggregate consideration of $12,999,993.

At the initial Series A-1 closing in July 2014, Atlas Venture Fund IX and NEA 14 both purchased their allotted Series A-1 share amounts under the Series A Purchase Agreement, and Atlas Venture Fund IX also received 143,158 shares of Series A-1 preferred stock upon the conversion of the Atlas Note.

In September 2014, the parties amended the Series A Purchase Agreement to include the Gates Foundation as a purchaser. The amended Series A Purchase Agreement included an aggregate increase of 181,818 available shares of Series A-1 preferred stock at a purchase price of $2.75 per share, for aggregate additional consideration of $500,000. The Gates Foundation purchased its allotted Series A-1 share amount under the amended Series A Purchase Agreement at a subsequent closing in September 2014.

In May 2015, the parties amended and restated the Series A Purchase Agreement to increase the amounts of Series A-2 preferred stock, Series A-3 preferred stock and Series A-4 preferred stock available for issuance and sale as follows: (i) 2,371,428 shares of Series A-2 preferred stock at a purchase price of $3.50 per share for aggregate consideration of $8,299,998; (ii) 2,499,998 shares of Series A-3 preferred stock at a purchase price of $4.00 per share for aggregate consideration of $9,999,992; and (iii) 1,293,938 shares of Series A-4 preferred stock at a purchase price of $5.50 per share for aggregate consideration of $7,116,659. Concurrent with the amendment and restatement of the Series A Purchase Agreement, all of the shares of Series A-2 preferred stock allotted to each of Atlas Venture Fund IX, NEA 14 and the Gates Foundation under the amended and restated Series A Purchase Agreement were issued and sold to each purchaser.

Shortly after the May 2015 closing referenced above, all shares of Synlogic were contributed by the shareholders of Synlogic to Synlogic, LLC in exchange for membership units in Synlogic, LLC, and the Series A Purchase Agreement was replaced with a Class A purchase agreement for units in Synlogic, LLC, as further described below.

The tables below set forth the aggregate number of shares of Series A-1 preferred stock and Series A-2 preferred stock issued and sold pursuant to the Series A Purchase Agreement to Synlogic's directors, executive officers or holders of more than 5% of its capital stock at the time of such issuance.

Name	Series A-1 Preferred Stock	Total Purchase Price
Atlas Venture Fund IX, L.P.(1)	559,770	$ 1,499,998
New Associate Enterprises 14, L.P.	727,272	$ 1,999,998
Bill & Melinda Gates Foundation	363,636	$ 999,999

(1) Includes (i) 416,612 shares of Series A-1 preferred stock sold at $2.75 per share for aggregate consideration of $1,145,683, and (ii) 143,158 shares of Series A-1 preferred stock issued upon conversion of the Atlas Note in the amount of $354,315 (including a principal amount of $350,000 and accrued interest of $4,315) at $2.475 per share (representing a 10 percent discount on the Series A-1 purchase price).

Name	Series A-2 Preferred Stock	Total Purchase Price
Atlas Venture Fund IX, L.P.	790,476	$ 2,766,666
New Associate Enterprises 14, L.P.	1,185,714	$ 4,149,999
Bill & Melinda Gates Foundation	395,238	$ 1,383,333

Class A Preferred Unit Financing of Synlogic, LLC

In July 2015, in connection with the reorganization of Synlogic into a wholly owned subsidiary of Synlogic, LLC, the shareholders of Synlogic contributed their shares to Synlogic, LLC in exchange for membership units in Synlogic, LLC. Each of Atlas Venture Fund IX, NEA 14 and the Gates Foundation then entered into a Class A preferred unit purchase agreement (the "Class A Purchase Agreement"), with Synlogic, LLC on terms substantially equivalent to the terms of the Series A Purchase Agreement with Synlogic. Pursuant to the Class A Purchase Agreement, Synlogic, LLC agreed to issue and sell to Atlas Venture Fund IX, NEA 14 and the Gates Foundation an aggregate of (i) 2,499,998 Class A-3 preferred units at a purchase price of $4.00 per unit for aggregate consideration of $9,999,992 and (ii) 1,293,938 Class A-4 preferred units at a purchase price of $5.50 per unit for aggregate consideration of $7,116,659.

In February 2016, immediately prior to the consummation of the Class B preferred unit financing of Synlogic, LLC, as described below, the Class A investors and Synlogic, LLC amended the Class A Purchase Agreement to combine the aggregate amounts of Class A-3 preferred units and Class A-4 preferred units available for issuance and sale into a single issuance and sale of Class A-3 preferred units, eliminating the availability of Class A-4 preferred units. The amended Class A Purchase Agreement provided for the issuance and sale to investors of an aggregate of 4,279,162 Class A-3 preferred units at a purchase price of $4.00 per unit for aggregate consideration of $17,116,648. Atlas Venture Fund IX, NEA 14 and the Gates Foundation purchased all of their allotted Class A-3 preferred units at the only closing pursuant to the Class A Purchase Agreement in February 2016.

The table below sets forth the aggregate number of Class A-3 preferred units issued and sold pursuant to the amended Class A Purchase Agreement to Synlogic's directors, executive officers or holders of more than 5% of its capital stock at the time of such issuance.

Name	Class A-3 Preferred Units	Total Purchase Price
Atlas Venture Fund IX, L.P.	1,474,998	$ 5,899,992
New Associate Enterprises 14, L.P.	2,149,999	$ 8,599,996
Bill & Melinda Gates Foundation	654,165	$ 2,616,660

Class A-2 and Class B Subscription Agreements with Bharatt Chowrira

In December 2015, Synlogic, LLC entered into a subscription agreement with Bharatt Chowrira, then the president of Synlogic, whereby Dr. Chowrira purchased 201,484 Class A-2 preferred units sold and issued by Synlogic, LLC at a purchase price of $3.50 per unit, for aggregate consideration of $705,194.

In February 2016, Synlogic, LLC and Dr. Chowrira entered into a second subscription agreement whereby Dr. Chowrira purchased 79,525 Class B preferred units sold and issued by Synlogic, LLC at a purchase price of $7.4818 per unit, for aggregate consideration of $594,990.

Class B Preferred Unit Financing of Synlogic, LLC

In February 2016, in connection with its Class B preferred unit financing, Synlogic, LLC entered into a preferred unit purchase agreement (the "Class B Purchase Agreement"), among Atlas Venture Fund IX, NEA 14, OrbiMed Private Investments VI, L.P. ("OPI VI"), and Deerfield Private Design Fund III, L.P. ("Deerfield PDF III"), pursuant to which Synlogic, LLC agreed to issue and sell to investors an aggregate of 5,346,304 Class B preferred units at a purchase price of $7.4818 per unit for aggregate consideration of $39,999,981.

The investors purchased their full allotments of Class B preferred units at two closings in February 2016 and March 2017. At the February 2016 closing, Synlogic, LLC issued and sold an aggregate of 1,782,101 Class B preferred units for aggregate consideration of $13,333,327. At the March 2017 closing, Synlogic, LLC issued and sold an aggregate of 3,564,203 Class B preferred units for aggregate consideration of $26,666,654.

The table below sets forth the aggregate number of Class B preferred units issued and sold pursuant to the Class B Purchase Agreement to Synlogic's directors, executive officers or holders of more than 5% of its capital stock at the time of such issuance.

Name	Class B Preferred Units	Total Purchase Price
Atlas Venture Fund IX, L.P.	1,096,408	$ 8,203,105
New Associate Enterprises 14, L.P.	1,576,745	$ 11,796,891
OrbiMed Private Investments VI, L.P.	2,004,864	$ 14,999,991
Deerfield Private Design Fund III, L.P.	668,287	$ 4,999,993

Series C Preferred Stock Financing of Synlogic, Inc.

In May 2017, immediately following the consummation of the Reorganization, as described in the section entitled *"Synlogic Reorganization"* in this proxy statement/prospectus/information statement, in connection with its Series C preferred stock financing, Synlogic entered into a stock purchase agreement (the "Series C Purchase Agreement") among Atlas Venture Fund IX, NEA 14, OPI VI, Deerfield PDF III, entities affiliated with Perceptive Advisors, and certain other investors, pursuant to which Synlogic agreed to issue and sell to investors an aggregate of 5,210,922 shares of Series C preferred stock at a purchase price of $8.06 per share for aggregate consideration of $42,000,031. The Series C investors purchased their full allotments of Series C preferred shares at a single closing in May 2017.

The table below sets forth the aggregate number of shares of Series C preferred stock issued and sold pursuant to the Series C Purchase Agreement to Synlogic's directors, executive officers or holders of more than 5% of its capital stock at the time of such issuance.

Name	Series C Preferred Stock	Total Purchase Price
Atlas Venture Fund IX, L.P.	372,209	$ 3,000,005
New Associate Enterprises 14, L.P.	496,278	$ 4,000,001
OrbiMed Private Investments VI, L.P.	372,209	$ 3,000,005
Deerfield Private Design Fund III, L.P.	868,487	$ 7,000,005
Entities affiliated with Perceptive Advisors(1)	1,240,695	$ 10,000,002

(1) Consists of (i) 1,210,422 shares of Series C preferred stock purchased by Perceptive Life Sciences Master Fund, Ltd for consideration of $9,756,001 and (ii) 30,273 shares of Series C preferred stock purchased by Titan Perc Ltd for consideration of $244,000.

Voting Agreements

In connection with Synlogic's Series C preferred stock financing, on May 15, 2017, Synlogic entered into a voting agreement with certain directors, executive officers and 5% stockholders, and their affiliates. The voting agreement will terminate by its terms upon the Closing.

Synlogic has also entered into voting support agreements in connection with the Merger with certain directors, executive officers and 5% stockholders, and their affiliates. For a description of these voting support agreements, please see the section entitled "*Agreements Related to the Merger—Support Agreements*" in this proxy statement/prospectus/information statement.

Investors' Rights Agreement

In connection with Synlogic's Series C preferred stock financing, on May 15, 2017, Synlogic entered into an investors' rights agreement with the holders of its Series A-1, Series A-2, Series A-3, Series B and Series C preferred stock and certain key holders of Synlogic Common Stock. This agreement provides these holders with certain rights relating to the registration of their shares under the Securities Act.

This agreement also establishes certain "information and observer" rights and rights of first offer, and sets forth certain covenants relating to insurance, employee agreements, employee stock, indemnification, and related matters. Upon the Closing, all provisions relating to these rights and covenants, as well as all provisions relating to registration rights, will terminate.

Right of First Refusal and Co-Sale Agreement

In connection with Synlogic's Series C preferred stock financing, on May 15, 2017, Synlogic entered into a right of first refusal and co-sale agreement, including with certain directors, executive officers and 5% stockholders, and their affiliates. The right of first refusal and co-sale agreement will terminate upon the Closing.

Change of Control and Severance Benefit Agreements

See the section entitled "*Synlogic Executive Compensation*" in this proxy statement/prospectus/information statement for a description of these agreements.

Indemnification Agreements

Synlogic has entered into agreements to indemnify its directors and executive officers. These agreements will, among other things, require Synlogic to indemnify these individuals for certain expenses (including

attorneys' fees), judgments, fines and settlement amounts reasonably incurred by such person in any action or proceeding, including any action by or in Synlogic's right, on account of any services undertaken by such person on behalf of Synlogic or that person's status as a member of the Synlogic Board of Directors to the maximum extent allowed under Delaware law.

Loan to President and Chief Executive Officer

In September 2016, Synlogic agreed to issue a loan of $175,000 to its president and chief executive officer, Jose Carlos Gutierrez-Ramos, in exchange for a promissory note to Synlogic in the principal amount of $175,000 at an interest rate of 0.61 percent per annum. Dr. Gutierrez-Ramos repaid this loan in full, including accrued interest, in June 2017.

Policies and Procedures Regarding Related Party Transactions

While Synlogic does not have a formal written policy or procedure for the review, approval or ratification of related party transactions, the Synlogic Board of Directors reviews and considers the interests of its directors, executive officers and principal stockholders in its review and consideration of transactions and obtains the approval of non-interested directors when it determines that such approval is appropriate under the circumstances.

UNAUDITED PRO FORMA CONDENSED COMBINED FINANCIAL STATEMENTS

The following unaudited pro forma condensed combined financial statements give effect to the Merger and were prepared in accordance with the regulations of the SEC. The unaudited pro forma condensed combined financial statements were prepared using the acquisition method of accounting under U.S. GAAP. For accounting purposes, Synlogic is considered to be acquiring Mirna in the Merger. Synlogic was determined to be the accounting acquirer based upon the terms of the Merger Agreement and other factors including: (i) Synlogic Stockholders will own approximately 83% of the combined organization immediately following the Closing of the Merger, (ii) Synlogic directors will hold a majority of board seats in the combined organization and (iii) Synlogic management will hold all key positions in the management of the combined organization. For the purpose of these unaudited pro forma condensed combined financial statements, management of Mirna and Synlogic have determined a preliminary estimated purchase price, calculated as described in Note 2 to these unaudited pro forma condensed combined financial statements. The net tangible assets acquired and liabilities assumed in connection with the transaction are recorded at their estimated acquisition date fair values. A final determination of these estimated fair values will be based on the actual net tangible assets of Mirna that exist as of the date of completion of the transaction.

The following unaudited pro forma condensed combined financial statements also give effect to Synlogic's issuance and sale of 5,210,922 shares of Series C convertible preferred stock for total consideration of approximately $40.4 million, net of issuance costs of approximately $1.6 million (the "Issuance of Series C").

The unaudited pro forma condensed combined balance sheet as of March 31, 2017 assumes that the Merger and the Issuance of Series C took place on March 31, 2017 and combines the historical balance sheets of Mirna and Synlogic as of March 31, 2017. The unaudited pro forma condensed combined statement of operations for the three months ended March 31, 2017 and for the year ended December 31, 2016 assume that the Merger and the Issuance of Series C took place as of January 1, 2016, and combines the historical results of Mirna and Synlogic for the three months ended March 31, 2017 and for the year ended December 31, 2016, respectively. The historical financial statements of Mirna and Synlogic, which are provided elsewhere in this proxy statement/prospectus/information statement, have been adjusted to give pro forma effect to events that are (i) directly attributable to the Merger, (ii) factually supportable, and (iii) with respect to the statements of operations, expected to have a continuing impact on the combined results.

The unaudited pro forma condensed combined financial statements are based on the assumptions and adjustments that are described in the accompanying notes. The unaudited pro forma condensed combined financial statements and pro forma adjustments have been prepared based on preliminary estimates of fair value of assets acquired and liabilities assumed. Differences between these preliminary estimates and the final fair value of assets and liabilities acquired may occur and these differences could have a material impact on the accompanying unaudited pro forma condensed combined financial statements and the combined organization's future results of operations and financial position. The actual amounts recorded as of the completion of the Merger may differ materially from the information presented in these unaudited pro forma combined financial statements as a result of the amount of cash used by Mirna's operations between the signing of the Merger Agreement and the Closing of the Merger; the timing of Closing of the Merger; and other changes in the Mirna's assets and liabilities that occur prior to the completion of the Merger.

The unaudited pro forma condensed combined financial statements do not give effect to the potential impact of current financial conditions, regulatory matters, operating efficiencies or other savings or expenses that may be associated with the acquisition. The unaudited pro forma condensed combined financial statements have been prepared for illustrative purposes only and are not necessarily indicative of the financial position or results of operations in future periods or the results that actually would have been realized had Mirna and Synlogic been a combined organization during the specified period. The unaudited pro forma condensed combined financial statements, including the notes thereto, should be read in conjunction with the Mirna and Synlogic historical audited financial statements for the year ended December 31, 2016 and the unaudited condensed financial statements for the three months ended March 31, 2017 included elsewhere in this proxy statement/prospectus/information statement.

Unaudited Pro Forma Condensed Combined Balance Sheet
as of March 31, 2017
(in thousands)

	Mirna	Synlogic	Pro Forma Merger Adjustments		Combined Organization
Assets					
Current assets:					
Cash and cash equivalents	$ 17,121	$ 34,146	$ 40,400	A	$ 91,667
Short-term marketable securities	40,408	—	—		40,408
Prepaid expenses and other current assets	620	1,157	—		1,777
Total current assets	58,149	35,303	40,400		133,852
Property and equipment, net	26	3,368	—		3,394
Restricted cash	2,433	50	—		2,483
Other assets	—	415	—		415
Total assets	$ 60,608	$ 39,136	$ 40,400		$ 140,144
Liabilities, contingently redeemable preferred stock and stockholders' equity (deficit)					
Current liabilities:					
Accounts payable	$ 371	$ 500	$ —		$ 871
Accrued expenses	4,486	2,704	6,862	B	21,087
	—	—	2,035	C	—
	—	—	5,000	D	—
Deferred revenue	—	444	—		444
Deferred rent	—	262	—		262
Capital lease obligations	—	190	—		190
Total current liabilities	4,857	4,100	13,897		22,854
Lease obligations, long-term					
Deferred revenue, net of current	—	1,001	—		1,001
Deferred rent, net of current	—	991	—		991
Capital lease obligations, net of current	—	130	—		130
Total liabilities	$ 4,857	$ 6,222	$ 13,897		$ 24,976
Stockholders' equity (deficit)					
Contingently redeemable class A preferred stock	—	5,000	(5,000)	A	—
Class A preferred stock	—	40,260	(40,260)	A	—
Class B preferred stock	—	25,548	(25,548)	A	—
Common stock	21	722	(722)	E	43
	—	—	3	E	—
	—	—	19	A	—
Additional paid in capital	163,518	—	(107,771)	F	158,732
	—	—	(11,862)	F	—
	—	—	111,189	A	—
	—	—	719	E	—
	—	—	2,939	G	—
Accumulated deficit	(107,771)	(38,616)	107,771	F	(43,590)
	—	—	11,862	F	—
	—	—	(6,862)	B	—
	—	—	(2,035)	C	—
	—	—	(5,000)	D	—
	—	—	(2,939)	G	—
Accumulated other comprehensive loss	(17)	—	—		(17)
Total stockholders' equity	55,751	32,914	26,503		115,168
Total liabilities, contingently redeemable preferred stock and stockholders' equity	$ 60,608	$ 39,136	$ 40,400		$ 140,144

Unaudited Pro Forma Condensed Combined Statements of Operations
(in thousands, except per share amounts)

	For the Year Ended December 31, 2016				
	Mirna	Synlogic	Pro Forma Merger Adjustments		Combined Organization
Revenue	$ —	$ 444	$ —		$ 444
Operating expense					
Research and development	(13,930)	(15,010)	1,466	I	(27,474)
General and administrative	(8,118)	(6,398)	50	H	(15,932)
	—	—	(1,466)	I	—
Restructuring expense	(4,442)	—	—		(4,442)
Loss on disposal of assets	(128)	—	—		(128)
Total operating expenses	(26,618)	(21,408)	50		(47,976)
Loss from operations	(26,618)	(20,964)	50		(47,532)
Interest income	350	10	—		360
Net loss	$ (26,268)	$ (20,954)	$ 50		$ (47,172)
Other comprehensive loss:					
Unrealized gain/ (loss) on available for sale securities, net of tax	$ (4)	$ —	$ —		$ (4)
Total other comprehensive loss	$ (26,272)	$ (20,954)	$ 50		$ (47,176)
Net loss per share, basic and diluted	$ (1.26)	$ (7.36)	$ —		$ (0.52)
Weighted average common shares	20,833,963	2,848,081	66,560,165	J	90,242,209

Unaudited Pro Forma Condensed Combined Statements of Operations
(in thousands, except per share amounts)

	For the Three Months Ended March 31, 2017				
	Mirna	Synlogic	Pro Forma Merger Adjustments		Combined Organization
Revenue	$ —	$ 111	$ —		$ 111
Operating expense					
Research and development	(242)	(5,118)	—		(5,360)
General and administrative	(2,264)	(2,367)	461	H	(3,907)
	—	—	263	H	—
Restructuring expense	(2,557)	—	—		(2,557)
Loss on disposal of assets	—	—	—		—
Total operating expenses	(5,063)	(7,485)	724		(11,824)
Loss from operations	(5,063)	(7,374)	724		(11,713)
Interest income	86	6	—		92
Net loss	$ (4,977)	$ (7,368)	$ 724		$ (11,621)
Other comprehensive loss:					
Unrealized gain/ (loss) on available for sale securities, net of tax	(13)	—	—		(13)
Total other comprehensive loss	$ (4,990)	$ (7,368)	$ 724		$ (11,634)
Net loss per share, basic and diluted	$ (0.24)	$ (2.49)	$ 0.01		$ (0.11)
Weighted average common shares	20,850,494	2,965,234	80,312,152	J	104,127,880

NOTES TO UNAUDITED PRO FORMA CONDENSED COMBINED FINANCIAL INFORMATION

1. Description of Transactions and Basis of Presentation

Description of Transactions

On May 15, 2017, Mirna entered into an Agreement and Plan of Merger and Reorganization (the "Merger Agreement") with Synlogic, with Synlogic becoming a wholly owned subsidiary of Mirna and the surviving corporation following completion of the merger (the "Merger") in accordance with the Merger Agreement.

Immediately after the Merger, Synlogic will own approximately 83% of the fully-diluted common stock of the combined organization, with Mirna security holders owning approximately 17% of the fully-diluted common stock of the combined organization. These estimates are based on the anticipated Exchange Ratio as defined in the Merger Agreement and are subject to adjustment.

In May of 2017, Synlogic issued and sold 5,210,922 shares of Series C convertible preferred stock for total consideration of approximately $40.4 million, net of issuance costs of approximately $1.6 million ("Issuance of Series C").

Basis of Presentation

The unaudited pro forma condensed combined financial statements were prepared in accordance with the regulations of the Securities and Exchange Commission ("SEC"). The unaudited pro forma condensed combined balance sheet as of March 31, 2017 is presented as if the Merger and the Issuance of Series C had been completed on March 31, 2017. The unaudited pro forma condensed combined statement of operations for the three months ended March 31, 2017 and for the year ended December 31, 2016 assume that the Merger and the Issuance of Series C took place on January 1, 2016, and combines the historical results of Mirna and Synlogic for the three months ended March 31, 2017, and for the year ended December 31, 2016, respectively. For accounting purposes, Synlogic is considered to be acquiring Mirna in the Merger. Synlogic was determined to be the accounting acquirer based upon the terms of the Merger Agreement and other factors including: (i) Synlogic Stockholders will own approximately 83% of the combined organization immediately following the Closing of the Merger, (ii) Synlogic directors will hold a majority of board seats in the combined organization and (iii) Synlogic management will hold all key positions in the management of the combined organization. Accordingly, the assets and liabilities of Synlogic will be recorded as of the Merger closing date at their respective carrying value and the acquired net assets of Mirna will be recorded as of the Merger closing date at their fair value. For the purpose of these unaudited pro forma financial statements, management of Synlogic and Mirna have determined a preliminary estimated purchase price for the asset acquisition, and such amount has been calculated as described in Note 2 to these unaudited pro forma condensed combined financial statements. The net assets acquired in connection with the transaction are at their estimated fair values. A final determination of these estimated fair values will be based on the actual net acquired assets of Mirna as of the Merger closing date.

During May 2017, in contemplation of the merger transaction, Synlogic undertook a legal reorganization into a corporation. In connection with that transaction, all preferred stock and common units were converted 1:1 into preferred and common stock. As such, application of the anticipated Exchange Ratio and the impacts on the related pro forma adjustments to earnings per share contemplate the conversion of Synlogic's preferred and common units into preferred and common stock immediately prior to the conversion to Mirna Common Stock.

2. Preliminary Purchase Price

The estimated fair value of the net assets of Mirna, on a pro forma basis on March 31, 2017, after giving effect to obligation resulting from a settlement with the Cancer Prevention and Research Institute of Texas ("CPRIT") and the accrual of other costs expected to be incurred in connection with the Merger was

$43.9 million. As Mirna's net assets are predominantly comprised of cash and short term investments offset by current liabilities, the pro forma carrying value of Mirna's net assets is considered to be the best indicator of the fair value and, therefore, the preliminary estimated purchase price as of March 31, 2017. The estimated preliminary purchase price at the Merger closing date will change due to the amount of cash used by Mirna's operations after March 31, 2017 to the closing of the Merger and other changes in the Mirna assets and liabilities that occur through the completion of the Merger.

The preliminary acquired net assets of Mirna based on their pro forma estimated fair values as of March 31, 2017 are as follows (in thousands):

Cash and cash equivalents	$ 17,121
Short-term marketable securities	40,408
Prepaid and other current assets	620
Property and equipment, net	26
Restricted cash	2,433
Current liabilities	(16,719)
Net acquired tangible assets	$ 43,889

The allocation of the estimated purchase price is preliminary because the proposed Merger has not yet been completed. The purchase price allocation will remain preliminary until Synlogic determines the fair values of assets acquired and liabilities assumed. The final determination of the purchase price allocation is anticipated to be completed as soon as practicable after completion of the Merger and will be based on the fair values of the assets acquired and liabilities assumed as of the Merger closing date. Synlogic does not expect to acquire or assign any value to intangible assets. The final amounts allocated to assets acquired and liabilities assumed could differ significantly from the amounts presented in the unaudited pro forma condensed combined financial statements.

3. Pro Forma Adjustments

The unaudited pro forma condensed combined financial statements include pro forma adjustments to give effect to Synlogic's issuance of Series C convertible preferred stock in addition to the acquisition of Mirna's net assets by Synlogic. The pro forma adjustments reflecting the completion of the Merger are based upon the assumptions set forth below.

A. To reflect the $40.4 million of net proceeds from Synlogic's issuance of Series C convertible preferred stock and the conversion of all Synlogic convertible preferred stock to Mirna Common Stock in connection with the Merger.

B. To record Mirna's estimated transaction costs, such as severance and benefits, advisory fees and transactional fees that were not incurred as of March 31 2017.

C. To record Synlogic's estimated transaction costs, such as severance and benefits, advisory fees and transactional fees that were not incurred as of March 31 2017.

D. To record the $5.0 million CPRIT settlement that was not incurred as of March 31 2017.

E. To reflect the conversion of Synlogic Common Stock to Mirna Common Stock.

F. To reflect the elimination of Mirna's historical accumulated deficit, including the impact of the pro forma adjustments to Mirna's current liabilities.

G. To record stock compensation expense for the acceleration of certain executive and employee stock options outstanding at March 31, 2017, which fully vest upon completion of the Merger in accordance with the terms of the employment contracts for which there is no future service requirement.

H. To reflect elimination of transaction costs, such as severance and benefits, advisory fees, and transactional fees, of both Mirna and Synlogic.

I. To reclassify certain expenses of Mirna's to conform to Synlogic's presentation.

J. To reflect weighted average shares of the issuance of Synlogic's convertible preferred stock as well as the conversion of Synlogic convertible preferred and common stock to Mirna Common Stock based on the anticipated exchange ratio.

DESCRIPTION OF MIRNA CAPITAL STOCK

The following description of Mirna's capital stock is not complete and may not contain all the information you should consider before investing in Mirna's capital stock. This description is summarized from, and qualified in its entirety by reference to, Mirna's amended and restated certificate of incorporation and amended and restated bylaws, which have been publicly filed with the SEC. See "*Where You Can Find More Information*."

Mirna's authorized capital stock consists of:

- 250,000,000 shares of Mirna Common Stock, $0.001 par value, of which 20,856,693 shares have been issued and are outstanding as of May 31, 2017; and
- 5,000,000 shares of preferred stock, $0.001 par value, of which no shares have been issued and are outstanding as of May 31, 2017.

Mirna Common Stock

The holders of Mirna Common Stock are entitled to one vote per share on all matters to be voted upon by the Mirna Stockholders and there are no cumulative rights. Subject to preferences that may be applicable to any outstanding preferred stock, the holders of Mirna Common Stock are entitled to receive ratably any dividends that may be declared from time to time by the Mirna Board of Directors out of funds legally available for that purpose. In the event of liquidation of Mirna, dissolution or winding up, the holders of Mirna Common Stock are entitled to share ratably in all assets remaining after payment of liabilities, subject to prior distribution rights of preferred stock then outstanding. The Mirna Common Stock has no preemptive or conversion rights or other subscription rights. There are no redemption or sinking fund provisions applicable to the Mirna Common Stock. The outstanding shares of Mirna Common Stock are fully paid and non-assessable, and any shares of Mirna Common Stock to be issued upon an offering pursuant to this proxy statement/prospectus/information statement and the related prospectus supplement will be fully paid and nonassessable upon issuance.

Transfer Agent

The transfer agent and registrar for Mirna Common Stock is American Stock Transfer & Trust Company, LLC. Its address is 6201 15th Avenue, Brooklyn, NY 11219.

Dividend

Mirna has never declared or paid any cash dividends on the Mirna Common Stock and does not anticipate paying cash dividends on the Mirna Common Stock for the foreseeable future. Notwithstanding the foregoing, any determination to pay cash dividends subsequent to the Merger will be at the discretion of the combined organization's then-current board of directors and will depend upon a number of factors, including the combined organization's results of operations, financial condition, future prospects, contractual restrictions, restrictions imposed by applicable law and other factors the then-current Mirna Board of Directors deems relevant.

Preferred Stock

The following description of preferred stock and the description of the terms of any particular series of preferred stock that Mirna chooses to issue hereunder are not complete. These descriptions are qualified in their entirety by reference to Mirna's amended and restated certificate of incorporation and the certificate of designation relating to any series of preferred stock issued by Mirna. The rights, preferences, privileges and restrictions of the preferred stock of each series will be fixed by the certificate of designation relating to that series.

Mirna currently has no shares of Mirna's preferred stock outstanding. The Mirna Board of Directors has the authority, without further action by the stockholders, to issue up to 5,000,000 shares of preferred stock in one or

more series and to fix the rights, preferences, privileges and restrictions granted to or imposed upon the preferred stock. Any or all of these rights may be greater than the rights of the Mirna Common Stock.

The Mirna Board of Directors, without stockholder approval, can issue preferred stock with voting, conversion or other rights that could negatively affect the voting power and other rights of the holders of Mirna Common Stock. Preferred stock could thus be issued quickly with terms calculated to delay or prevent a change in control of Mirna or make it more difficult to remove Mirna's management. Additionally, the issuance of preferred stock may have the effect of decreasing the market price of Mirna Common Stock.

The Mirna Board of Directors may specify the following characteristics of any preferred stock:

- the maximum number of shares;
- the designation of the shares;
- the annual dividend rate, if any, whether the dividend rate is fixed or variable, the date or dates on which dividends will accrue, the dividend payment dates, and whether dividends will be cumulative;
- the price and the terms and conditions for redemption, if any, including redemption at the option of Mirna or at the option of the holders, including the time period for redemption, and any accumulated dividends or premiums;
- the liquidation preference, if any, and any accumulated dividends upon the liquidation, dissolution or winding up of Mirna's affairs;
- any sinking fund or similar provision, and, if so, the terms and provisions relating to the purpose and operation of the fund;
- the terms and conditions, if any, for conversion or exchange of shares of any other class or classes of Mirna's capital stock or any series of any other class or classes, or of any other series of the same class, or any other securities or assets, including the price or the rate of conversion or exchange and the method, if any, of adjustment;
- the voting rights;
- any or all other preferences and relative, participating, optional or other special rights, privileges or qualifications, limitations or restrictions; and
- any preferred stock issued will be fully paid and nonassessable upon issuance.

Anti-Takeover Effects of Provisions of Mirna Charter Documents

Mirna's amended and restated certificate of incorporation provides for the Mirna Board of Directors to be divided into three classes serving staggered terms. Approximately one-third of the Mirna Board of Directors will be elected each year. The provision for a classified board could prevent a party who acquires control of a majority of Mirna's outstanding voting stock from obtaining control of the Mirna Board of Directors until the second annual stockholders meeting following the date the acquirer obtains the controlling stock interest. Mirna's classified board provision could discourage a potential acquirer from making a tender offer or otherwise attempting to obtain control of Mirna and could increase the likelihood that incumbent directors will retain their positions. Mirna's amended and restated certificate of incorporation provides that, subject to the special rights of holders of one or more series of preferred stock, directors may be removed at any time, but only for cause by the affirmative vote of the holders of at least 66 and 2/3% of the voting power of all outstanding voting stock of Mirna.

Mirna's amended and restated certificate of incorporation provides that certain amendments of Mirna's certificate of incorporation and amendments by Mirna Stockholders of Mirna's amended and restated bylaws require the approval of at least 66 and 2/3% of the voting power of all outstanding stock. These provisions could discourage a potential acquirer from making a tender offer or otherwise attempting to obtain control of Mirna and could delay changes in management.

Mirna's amended and restated bylaws establish an advance notice procedure for stockholder proposals to be brought before an annual meeting of Mirna Stockholders, including proposed nominations of persons for election to the Mirna Board of Directors. At an annual meeting, stockholders may only consider proposals or nominations specified in the notice of meeting or brought before the meeting by or at the direction of the Mirna Board of Directors. Stockholders may also consider a proposal or nomination by a person who was a stockholder at the time of giving notice and at the time of the meeting, who is entitled to vote at the meeting and who has complied with the notice requirements of Mirna's amended and restated bylaws in all respects provided that such proposal is properly made in accordance with Rule 14a-8 under the Exchange Act. The amended and restated bylaws do not give the Mirna Board of Directors the power to approve or disapprove stockholder nominations of candidates or proposals regarding other business to be conducted at a special or annual meeting of the stockholders. However, Mirna's amended and restated bylaws may have the effect of precluding the conduct of business at a meeting if the proper procedures are not followed. These provisions may also discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the potential acquirer's own slate of directors or otherwise attempting to obtain control of Mirna.

Mirna's amended and restated bylaws provide that a special meeting of Mirna Stockholders may be called at any time by the Mirna Board of Directors. Because Mirna Stockholders do not have the right to call a special meeting, a Mirna Stockholder cannot force stockholder consideration of a proposal over the opposition of the Mirna Board of Directors by calling a special meeting of stockholders prior to such time as a majority of the Mirna Board of Directors believed the matter should be considered and such Mirna Stockholder would only be able to force consideration of such proposal at the next annual meeting, *provided* that the requestor met the notice requirements. The restriction on the ability of Mirna Stockholders to call a special meeting means that a proposal to replace one or more directors on the Mirna Board of Directors also could be delayed until the next annual meeting.

Mirna's amended and restated bylaws do not allow stockholders to act by written consent without a meeting. Without the availability of stockholder action by written consent, a holder controlling a majority of Mirna's capital stock would not be able to amend Mirna's amended and restated bylaws or remove directors without holding a stockholders' meeting.

Anti-Takeover Effects of Delaware Law

Mirna is subject to the provisions of Section 203 of the DGCL ("Section 203"). Under Section 203, Mirna would generally be prohibited from engaging in any business combination with any interested stockholder for a period of three years following the time that such stockholder became an interested stockholder unless:

- prior to this time, the board of directors of the corporation approved either the business combination or the transaction that resulted in the stockholder becoming an interested stockholder;
- upon consummation of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding shares owned by persons who are directors and also officers, and by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or
- at or subsequent to such time, the business combination is approved by the board of directors and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least 66 2/3% of the outstanding voting stock that is not owned by the interested stockholder.

Under Section 203, a "business combination" includes:

- any merger or consolidation involving the corporation and the interested stockholder;

- any sale, transfer, pledge or other disposition of 10% or more of the assets of the corporation involving the interested stockholder;
- any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder, subject to limited exceptions;
- any transaction involving the corporation that has the effect of increasing the proportionate share of the stock of any class or series of the corporation beneficially owned by the interested stockholder; or
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

In general, Section 203 defines an interested stockholder as an entity or person beneficially owning 15% or more of the outstanding voting stock of the corporation and any entity or person affiliated with or controlling or controlled by such entity or person.

The provisions of Delaware law and Mirna's amended restated certificate of incorporation and amended and restated bylaws could have the effect of discouraging others from attempting hostile takeovers and, as a consequence, they may also inhibit temporary fluctuations in the market price of Mirna Common Stock that often result from actual or rumored hostile takeover attempts. These provisions may also have the effect of preventing changes in management. It is possible that these provisions may make it more difficult to accomplish transactions that Mirna Stockholders may otherwise deem to be in their best interests.

COMPARISON OF RIGHTS OF HOLDERS OF MIRNA STOCK AND SYNLOGIC STOCK

Both Mirna and Synlogic are incorporated under the laws of the State of Delaware and, accordingly, the rights of the stockholders of each are currently, and will continue to be, governed by the DGCL. If the Merger is completed, Synlogic Stockholders will become Mirna Stockholders, and their rights will be governed by the DGCL, the amended and restated bylaws of Mirna and, assuming Proposal Nos. 2 and 3 are approved by Mirna Stockholders at the Annual Meeting, the amended and restated certificate of incorporation of Mirna, as amended by the amendments thereto attached to this proxy statement/prospectus/information statement as *Annex D* and *Annex E*, respectively.

The table below summarizes the material differences between the current rights of Synlogic Stockholders under Synlogic's amended and restated certificate of incorporation and bylaws and the rights of Mirna Stockholders, post-Merger, under Mirna's amended and restated certificate of incorporation and bylaws, each as amended, as applicable, and as in effect immediately following the Merger.

While Mirna and Synlogic believe that the summary tables cover the material differences between the rights of their respective stockholders prior to the Merger and the rights of Mirna Stockholders following the Merger, these summary tables may not contain all of the information that is important to you. These summaries are not intended to be a complete discussion of the respective rights of Mirna Stockholders and Synlogic Stockholders and are qualified in their entirety by reference to the DGCL and the various documents of Mirna and Synlogic that are referred to in the summaries. You should carefully read this entire proxy statement/prospectus/information statement and the other documents referred to in this proxy statement/prospectus/information statement for a more complete understanding of the differences between being a Mirna Stockholder and a Synlogic Stockholder before the Merger and being a Mirna Stockholder after the Merger. Mirna has filed copies of its current amended and restated certificate of incorporation and bylaws with the SEC and will send copies of the documents referred to in this proxy statement/prospectus/information statement to you upon your request. Synlogic will also send copies of its documents referred to in this proxy statement/prospectus/information statement to you upon your request. See the section entitled *"Where You Can Find More Information"* in this proxy statement/prospectus/information statement.

Current Synlogic Rights Versus Mirna Rights Post-Merger

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
	Elections; Voting; Procedural Matters	
Authorized Capital Stock	The second amended and restated certificate of incorporation of Synlogic authorizes the issuance of up to 26,300,000 shares of common stock, $0.0001 par value per share, and 20,132,055 shares of preferred stock, $0.0001 par value per share, 1,650,678 of which are designated as Series A-1 preferred stock, 2,572,912 of which are designated as "Series A-2 preferred stock, 4,279,162 of which are designated as Series A-3 preferred stock, 5,425,829 of which are designated as Series B preferred stock, and 6,203,474 of which are designated as Series C preferred stock.	The amended and restated certificate of incorporation of Mirna authorizes the issuance of up to 250,000,000 shares of common stock, par value $0.001 per share, and 5,000,000 shares of preferred stock, par value $0.001 per share.

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
Number of Directors	The amended and restated by-laws of Synlogic currently provide that the number of directors which shall constitute the whole Synlogic Board of Directors shall be determined by resolution of the Synlogic Board of Directors or by the Synlogic Stockholders at the annual meeting or at any special meeting of Synlogic Stockholders.	The amended and restated certificate of incorporation of Mirna currently provides that the number of directors that shall constitute the whole Mirna Board of Directors shall be fixed exclusively by one or more resolutions adopted from time to time by the Mirna Board of Directors.
Stockholder Nominations and Proposals	The second amended and restated certificate of incorporation and amended and restated by-laws of Synlogic do not provide for procedures with respect to stockholder proposals or director nominations.	The amended and restated bylaws of Mirna provide that nominations of any person for election to the Mirna Board of Directors at an annual meeting or at a special meeting (but only if the election of directors is a matter specified in the notice of meeting given by or at the discretion of the person calling such special meeting) may be made at such meeting only (a) by or at the direction of the Mirna Board of Directors, including by any committee or persons authorized to do so by the Mirna Board of Directors, or (b) by a stockholder present in person (A) who was a beneficial owner of shares of Mirna both at the time of giving the notice of such meeting and at the time of the meeting, (B) is entitled to vote at the meeting and (C) has complied with the notice and nomination provisions of the amended and restated bylaws of Mirna. The amended and restated bylaws of Mirna provide that in order for a stockholder to properly bring business before an annual meeting, the stockholder must be a stockholder who (A)(1) was a beneficial owner of shares of Mirna both at the time of giving the notice of such meeting and at the time of the meeting, (2) is entitled to vote at the meeting and (3) has complied with the

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
		notice and proposal provisions of the amended and restated bylaws of Mirna, or (B) properly made such proposal in accordance with Rule 14a-8 under the Exchange Act, and the rules and regulations promulgated thereunder. The amended and restated bylaws of Mirna further provide that stockholders shall not be permitted to propose business to be brought before a special meeting of the stockholders.
Classified Board of Directors	The second amended and restated certificate of incorporation of Synlogic does not provide for the division of the Synlogic Board of Directors into staggered classes.	The amended and restated certificate of incorporation of Mirna provides that the directors comprising the Mirna Board of Directors shall be divided into three staggered classes, with each class serving a three-year term.
Removal of Directors	Directors may be removed, with or without cause, by the affirmative vote of the holders of the shares of the class or series of stock of Synlogic (or different classes or series voting separately, or together as the case may be) entitled to elect such director or directors, given either at a special meeting of such stockholders duly called for that purpose or pursuant to a written consent of stockholders.	Under the amended and restated certificate of incorporation of Mirna, a director may be removed from office at any time, but only for cause and only by the affirmative vote of the holders of 66 and 2/3% of the voting power of all then outstanding shares of voting stock of Mirna with the power to vote at an election of directors.
Special Meeting of the Stockholders	The amended and restated by-laws of Synlogic provide that special	The amended and restated certificate of incorporation of

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
	meetings of stockholders may be called at any time by the Synlogic Board of Directors pursuant to a resolution adopted by a majority of the total number of directors Authorized or at the request in writing of the holders of at least 66 and 2/3% of the outstanding shares of Synlogic Preferred Stock, together as a single class.	Mirna and the amended and restated bylaws of Mirna provide that a special meeting of the stockholders of Mirna may be called, for any purpose or purposes, at any time by the Mirna Board of Directors, but such special meetings may not be called by stockholders or any other person or persons.
Cumulative Voting	The amended and restated by-laws of Synlogic provide that a plurality of the votes cast shall be sufficient to elect a director at any meeting of Synlogic Stockholders held for the election of directors at which a quorum is present.	The amended and restated bylaws of Mirna provide that a plurality of the votes cast shall be sufficient to elect a director at a duly called or convened meeting of stockholders for the election of directors at which a quorum is present.
Vacancies	The second amended and restated certificate of incorporation of Synlogic and amended and restated by-laws of Synlogic provide that any vacancy or newly created directorships on the Synlogic Board of Directors may be filled only by vote or written consent of Synlogic Stockholders or by a majority vote of the directors then in office, though less than a quorum, or the sole remaining director.	The amended and restated certificate of incorporation and amended and restated bylaws of Mirna provide that any vacancy or newly created directorships on the Mirna Board of Directors will, unless the Mirna Board of Directors determines by resolution that any such vacancies or newly created directorships shall be filled by stockholders, and except as otherwise provided by law, be filled only by a majority of the directors then in office, although less than a quorum, or by a sole remaining director, and shall not be filled by the stockholders.
Voting Stock	Under the second amended and restated certificate of incorporation of Synlogic, the holders of Synlogic Common Stock are entitled to one vote for each share of stock held by them, and holders of Synlogic Preferred Stock are entitled to one vote for each share of Synlogic Common Stock into which such share of Synlogic Preferred Stock is convertible; provided, however, that (i) the holders of Series B preferred stock shall be entitled to	Under the amended and restated bylaws of Mirna, each stockholder shall be entitled to one vote for each share of capital stock held by such stockholder. The amended and restated bylaws of Mirna further state that in order for Mirna to determine which stockholders are entitled to vote, the Mirna Board of Directors may fix, in advance, a record date, which record date shall not precede the date on which the resolution

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
	elect one director, (ii) the holders of Series A-1 preferred stock, Series A-2 preferred stock and Series A-3 preferred stock collectively shall be entitled to elect two directors, and (iii) the holders of Series C preferred stock shall be entitled to elect one director if the Merger is not consummated by the End Date (as defined in the Merger Agreement).	fixing the record date is adopted and which shall not be more than 60 nor less than 10 days before the date of such meeting, nor more than 60 days prior to any other such action. If the Mirna Board of Directors does not so fix a record date, the record date for determining stockholders entitled to vote at a meeting of stockholders shall be at the close of business on the day next preceding the day on which notice is given, or, if notice is waived, at the close of business on the day next preceding the day on which the meeting is held.
Stockholders Agreement	Synlogic does not have a stockholders agreement. Synlogic and Synlogic Stockholders of Synlogic have entered into that certain Voting Agreement dated May 15, 2017, which provides, among other things, that: (i) one director shall be designated by Atlas Venture Fund IX, L.P. (for so long as Atlas Venture Fund IX, L.P. and its affiliated parties continues to hold at least 10% of the shares of Series A-1 preferred stock, Series A-2 preferred stock and Series A-3 preferred stock, collectively, of Synlogic originally issued to Atlas Venture Fund IX, L.P.); (ii) one director shall be designated by New Enterprise Associates 14, L.P. (for so long as New Enterprise Associates 14, L.P. and its affiliated parties continues to hold at least 10% of the shares of Series A-1 preferred stock, Series A-2 preferred stock and Series A-3 preferred stock, collectively, of Synlogic originally issued to New Enterprise Associates 14, L.P.); (iii) one director shall be designated by OrbiMed Private Investments VI, LP (for so long as OrbiMed Private Investments VI,	Mirna does not have a stockholders agreement or similar any such similar agreement with any of its stockholders in place.

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
	LP and its affiliated parties continues to hold at least 10% of the shares of Series B preferred stock of Synlogic originally issued to OrbiMed Private Investments VI, LP); (iv) if the Merger is not consummated by the End Date (as defined in the Merger Agreement, one director shall be designated by the holders of record of 66 and 2/3% of the Series C preferred stock of Synlogic; (v) two directors who possess appropriate domain expertise shall be designated by the mutual agreement of the directors designated in clauses (i) through (iv) above; and (vi) one director shall be the chief executive officer of Synlogic. The Voting Agreement will terminate upon the Closing.	
Drag Along	Under the Voting Agreement dated May 15, 2017, as further described therein, if the holders of 66 and 2/3% of all then outstanding shares of Synlogic Preferred Stock approve the sale of Synlogic, then each Synlogic Stockholder party to the Voting Agreement is required to vote in favor of such transaction or sell their shares, as applicable.	Mirna does not have any drag along terms in place.
Stockholder Action by Written Consent	The amended and restated by-laws of Synlogic provide that any action required or permitted to be taken at any annual or special meeting of Synlogic Stockholders may be taken without a meeting, without prior notice and without a vote, if a consent in writing, setting forth the action so taken, is (i) signed by the holders of outstanding Synlogic Capital Stock having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting at	The amended and restated certificate of incorporation and amended and restated bylaws of Mirna specify that any action required or permitted to be taken by the Mirna Stockholders must be effected at a duly called annual or special meeting of Mirna Stockholders and may not be effected by any consent in writing by such stockholders.

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
	which all shares entitled to vote on such action were present and voted and (ii) delivered to Synlogic via its registered office in the State of Delaware, its principal place of business, or an officer or agent of Synlogic having custody of Synlogic's records of stockholder meetings are recorded within 60 days of the earliest dated consent.	
Notice of Stockholder Meeting	The amended and restated by-laws of Synlogic provide that notices of all meetings shall state the place, date and time of the meeting. Notice of each meeting of stockholders shall be given not less than 10 nor more than 60 days before the date of the meeting to each Synlogic Stockholder entitled to vote at such meeting.	Under the amended and restated bylaws of Mirna, the notice of any meeting of stockholders shall be sent, or otherwise be deemed given (i) if mailed, when deposited in the U.S. mail, postage prepaid, directed to the stockholder at his or her address as it appears on Mirna's records, or (ii) if electronically transmitted as provided for in the amended and restated bylaws, not less than 10 nor more than 60 days before the date of the meeting to each stockholder entitled to vote at such meeting.
Conversion Rights and Protective Provisions	The second amended and restated certificate of incorporation of Synlogic provides that each holder of shares of Synlogic Preferred Stock shall have the right to convert such shares into shares of Synlogic Common Stock at any time in accordance with the second amended and restated certificate of incorporation of Synlogic. In addition, upon either (a) the closing of the sale of shares of common stock to the public at a price of at least 150% of the original issue price of the Series C preferred stock in a firm- commitment underwritten public offering resulting in at least $50 million of proceeds, (b) the date and time, or occurrence of an event, specified by the holders of each of New Enterprise Associates	The amended and restated certificate of incorporation of Mirna does not provide that holders of Mirna's capital stock shall have preemptive, conversion or other protective rights.

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
	14, L.P., Atlas Venture Fund IX, L.P., and OrbiMed Private Investments VI, LP or their affiliates (in each case, for so long as each such holder continues to own beneficially at least ten percent (10%) of the shares of Series A-1 preferred stock, Series A-2 preferred stock, Series A-3 preferred stock or Series B preferred stock initially acquired by each such holder), or (c) if in connection with an initial public offering that does not meet the qualifications described in clause (b) above, the date and time, or occurrence of an event, specified by the holders of at least 66 and 2/3% of the outstanding shares of Synlogic Preferred Stock, all outstanding shares of Synlogic Preferred Stock shall be converted into shares of Synlogic Common Stock. At any time when shares of Synlogic Preferred Stock are outstanding, Synlogic shall not, without the written consent or affirmative vote of the holders of at least 66 and 2/3% of the outstanding shares of Synlogic Preferred Stock: (i) sell, lease, transfer, exclusively license or otherwise dispose of, or permit any direct or indirect subsidiary to sell, lease, transfer, exclusively license or otherwise dispose of all or substantially all of the assets of Synlogic or such subsidiary; (ii) merge Synlogic (or any subsidiary) with another entity or acquisition of another entity or consummate an asset purchase of another entity; (iii) liquidate, dissolve or wind-up the business and affairs of Synlogic, effect any merger or consolidation or any Deemed Liquidation Event (as defined in the second amended and restated certificate of incorporation), or consent to any of the foregoing; (iv) acquire another entity, whether through a	

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
	merger or consolidation with such entity, the purchase of such entity's outstanding shares of capital stock, or the purchase, lease, exclusive license or other receipt by Synlogic or any of its subsidiaries, in a single transaction or series of related transactions, of all or substantially all of the assets of such entity; (v) grant a security interest in the assets of Synlogic, other than in the ordinary course of business; (vi) amend, alter or repeal any provision of the second amended and restated certificate of incorporation of the amended and restated by-laws of Synlogic whether by merger, consolidation or otherwise; (vii) redeem, repurchase or acquire (or permit any subsidiary to redeem, repurchase or acquire) any securities of the Synlogic (other than repurchases from the Gates Foundation pursuant to that certain side letter agreement between the Gates Foundation and Synlogic dated September 24, 2014, and other than repurchases of Synlogic Common Stock or options to purchase Synlogic Common Stock from former employees, officers, directors, consultants or other persons who performed services for Synlogic, or any subsidiary pursuant to the provisions of existing plans or agreements upon the termination of employment or service at the lower of the original purchase price and the then-current fair market value thereof; (viii) create, designate or authorize the creation of, or issue or obligate itself to issue shares of, any additional class or series of capital stock (whether by reclassification or otherwise) or issue or obligate itself to issue any shares of capital stock; (ix) create, or authorize the creation of, or issue, obligate itself to issue, or authorize the issuance	

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
	of any security convertible into equity securities of Synlogic (whether by reclassification or otherwise); (x) pay or declare any dividend or make any distribution on, any shares of capital stock of the Synlogic other than (1) redemptions of or dividends or distributions on the Synlogic Preferred Stock as expressly authorized herein, (2) dividends or other distributions payable on the Synlogic Common Stock solely in the form of additional shares of Synlogic Common Stock and (3) repurchases of Synlogic Common Stock or options to purchase Synlogic Common Stock from former employees, officers, directors, consultants or other persons who performed services for Synlogic, or any subsidiary pursuant to the provisions of existing plans or agreements upon the termination of employment or service at the lower of the original purchase price and the then-current fair market value thereof; (xi) (1) create, or hold capital stock in, any subsidiary that is not wholly owned (either directly or through one or more other subsidiaries) of Synlogic, (2) sell, transfer or otherwise dispose of any capital stock of any direct or indirect subsidiary of Synlogic, or (3) permit any direct or indirect subsidiary to sell, lease, transfer, exclusively license or otherwise dispose (in a single transaction or series of related transactions) of all or substantially all of the assets of such subsidiary; (xii) increase or decrease the authorized number of directors constituting the Synlogic Board of Directors; (xiii) guarantee, endorse, or otherwise become directly or contingently liable, or permit any subsidiary to guarantee, endorse, or otherwise become directly or contingently liable on any indebtedness of any other person,	

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
	firm or entity, except for trade accounts of Synlogic or any subsidiary arising in the ordinary course of business; (xiv) make, or permit any subsidiary to make, any loan or advance to any officer, director, employee, consultant, or any other person, or any subsidiary or other corporation, partnership, or entity; (xv) enter into any transaction with any director, officer or employee of Synlogic or any "associate" (as defined in Rule 12b-2 promulgated under the Securities Exchange Act of 1934) of any such person except for transactions made in the ordinary course of business and pursuant to reasonable requirements of Synlogic's business and upon fair and reasonable terms that are approved by a majority of disinterested directors of the Synlogic Board of Directors; (xvi) change to the principal business of Synlogic, or to enter new lines of business, or exit the current line of business; or (xvii) incur aggregate indebtedness of Synlogic in excess of $250,000. In addition, Synlogic shall not, without the written consent or affirmative vote of each of New Enterprise Associates 14, L.P., Atlas Venture Fund IX, L.P., and OrbiMed Private Investments VI, LP or their affiliates (in each case, for so long as each such holder continues to own beneficially at least ten percent (10%) of the shares of Series A-1 preferred stock, Series A-2 preferred stock, Series A-3 preferred stock or Series B preferred stock initially acquired by each such holder): (i) convert or exchange shares of Synlogic Preferred Stock into shares of Synlogic Common Stock (whether directly or indirectly, by amendment, merger, consolidation or otherwise), or (ii) directly or	

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
	indirectly by amendment, merger, consolidation or otherwise, create any subsidiary or hold equity interests of any entity that is not a corporation.	
Right of First Refusal	The Right of First Refusal and Co-Sale Agreement entered into among Synlogic and certain Synlogic Stockholders dated May 15, 2017 provides that any holder of Synlogic Common Stock that is a party to the Right of First Refusal and Co-Sale Agreement wishing to transfer any shares of Synlogic Common Stock shall first provide Synlogic with the right to purchase such shares. In such an event, if Synlogic does not elect to exercise its right of first refusal in full, any holder of Synlogic Preferred Stock has a secondary right of first refusal to purchase all or any portion of the shares of Synlogic Common stock which are proposed for sale or transfer by the holders of Synlogic Common Stock that are a party to the Right of First Refusal and Co-Sale Agreement. The Right of First Refusal and Co Sale Agreement will terminate upon the Closing. All holders of Synlogic Common Stock that are not bound by the Right of First Refusal and Co-Sale Agreement are bound by either an equity agreement, an exercise notice or a restricted stock agreement that provides that any holder of Synlogic Common Stock who wishes to transfer any shares of Synlogic Common Stock shall first provide Synlogic with the right to purchase such shares of Synlogic Common Stock.	Mirna does not have a right of first refusal in place.
Right of Co-Sale	As further described in the Right of First Refusal and Co-Sale Agreement, each holder of Synlogic Preferred Stock has a right of co-sale with respect to any	Mirna does not have a right of co-sale in place.

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
	Synlogic Common Stock proposed to be transferred or sold by any holder of Synlogic Common Stock that is a party to the Right of First Refusal and Co-Sale Agreement which is not earlier purchased by Synlogic by exercise of its right of first refusal (as further described above) or by any holder of Synlogic Preferred Stock by exercise of their secondary right of first refusal (as further described above).	
Indemnification of Officers and Directors and Advancement of Expenses; Limitation on Personal Liability		
Indemnification	The second amended and restated certificate of incorporation of Synlogic provides that Synlogic shall indemnify and hold harmless its directors and officers to the fullest extent permitted by applicable law. In addition, the amended and restated by-laws of Synlogic provide that Synlogic shall indemnify its officers, directors, agents and employees in the manner and to the full extent permitted by applicable law. Synlogic has entered into a number of indemnification agreements with its directors.	The amended and restated certificate of incorporation of Mirna provides that a director of Mirna shall not be personally liable to Mirna or its stockholders for monetary damages for breach of fiduciary duty as a director to the fullest extent permitted by the DGCL, as amended. The amended and restated certificate of incorporation of Mirna further provides that Mirna will, to the fullest extent permitted by law, indemnify and advance expenses to any person made or threatened to be made a party to an action, suit or proceeding by reason of the fact that he or she is or was a director or officer of Mirna. The amended and restated bylaws of Mirna provide that Mirna shall indemnify and hold harmless, to the fullest extent permitted by the DGCL, as amended, any director or officer of Mirna who was or is made or is threatened to be made a party to any proceeding, except that Mirna shall be required to indemnify an officer or director in connection with a proceeding initiated by such person only if the proceeding was authorized in the specific case by the Mirna Board of Directors. Such rights

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
		shall not be exclusive of any other rights which such person may have or hereafter acquire under any statute, provision of the certificate of incorporation, the bylaws, agreement, vote of stockholders or disinterested directors or otherwise.
Advancement of Expenses	The amended and restated by-laws of Synlogic provide that Synlogic shall pay the expenses incurred by a director or officer in defending any proceeding in advance of its final disposition, provided, that, to the extent required by law, such payment of expenses in advance of the final disposition of the proceeding shall be made only upon receipt of an undertaking by the director or officer to repay all amounts advanced if it should be ultimately determined that such director or officer is not entitled to be indemnified under the amended and restated by-laws of Synlogic or otherwise.	The amended and restated bylaws of Mirna provide that, to the fullest extent not prohibited by applicable law, Mirna shall pay the expenses incurred by any officer or director in defending any proceeding in advance of its final disposition, provided, however, that, to the extent required by law, such payment of expenses in advance of the final disposition of the proceeding shall be made only upon receipt of an undertaking by the person to repay all amounts in advance if it should be ultimately determined that the person is not entitled to be indemnified under the amended and restated bylaws of Mirna or otherwise.
	Dividends	
Declaration and Payment of Dividends	The second amended and restated certificate of incorporation of Synlogic provides that the holders of Synlogic Preferred Stock will be entitled, if, when and as declared by the Synlogic Board of Directors, to dividends in an amount at least equal to (i) in the case of a dividend on Synlogic Common Stock or any class or series that is convertible into Synlogic Common Stock, that dividend per share of such series of Synlogic Preferred Stock as would equal the product of (A) the dividend payable on each share of such class or series determined, if applicable, as if all shares of such class or series had been converted into Synlogic Common Stock and	The amended and restated bylaws of Mirna provide that the Mirna Board of Directors, subject to any restrictions contained in either (i) the DGCL or (ii) the certificate of incorporation, may declare and pay dividends upon the shares of its capital stock. Dividends may be paid in cash, in property or in shares of Mirna's capital stock. Furthermore, the Mirna Board of Directors may set apart out of any of Mirna's funds available for dividends a reserve or reserves for any proper purpose and may abolish any such reserve. The purposes for such reserve shall include but not be limited to equalizing dividends,

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
	(B) the number of shares of Synlogic Common Stock issuable upon conversion of a share of such series of Synlogic Preferred Stock, in each case calculated on the record date for determination of holders entitled to receive such dividend; provided that, if Synlogic declares, pays or sets aside, on the same date, a dividend on shares of more than one class or series of Synlogic Capital Stock, the dividend payable to the holders of Synlogic Preferred Stock shall be calculated based upon the dividend on the class or series of Synlogic Capital Stock that would result in the highest dividend. The holders of Synlogic Common Stock will be entitled, if, when and as declared by the Synlogic Board of Directors, to dividends payable on the Synlogic Common Stock solely in the form of additional shares of Synlogic Common Stock.	repairing or maintaining any property of Mirna and meeting contingencies.
Amendments to Certificate of Incorporation or Bylaws		
General Provisions	The second amended and restated certificate of incorporation of Synolgic may not be amended in a manner that materially alters or changes the rights, preferences or privileges of series of preferred stock so as to affect that series adversely in a manner different than other classes without the written consent or affirmative vote of (i) for Series A-1 preferred stock, Series A-2 preferred stock and Series A-3 preferred stock collectively, the holders of 70% of the outstanding shares of such series collectively; (ii) for Series B preferred stock, the holders of 75% of the outstanding shares of Series B preferred stock; and (iii) for Series C preferred stock, the holders of 66 and 2/3% of the outstanding shares of Series C preferred stock. The second amended and restated certificate of incorporation of Synolgic also states that holders of 66 and 2/3%	The amended and restated certificate of incorporation states that notwithstanding any other provisions of the amended and restated certificate of incorporation or any provision of law which might otherwise permit a lesser vote or no vote, but in addition to any affirmative vote of the holders of any particular class or series of the voting stock required by law or by the amended and restated certificate of incorporation, the affirmative vote of the holders of at least 66 and 2/3% of the voting power of all of the then-outstanding shares of the voting stock, voting together as a single class, shall be required to alter, amend or repeal Articles V (relating to the management of Mirna), VI (relating to action to be taken by stockholders), VII (relating to the limitation of liability of

Provision	Synlogic (Pre-Merger)	Mirna (Post-Merger)
	of all then outstanding shares of Synlogic Preferred Stock must affirmatively vote or consent in writing to the amendment, alteration or repeal of any provision of the certificate of incorporation.	directors), VIII (relating to exclusive forum selection) and IX (relating to the amendment of the certificate of incorporation) of the amended and restated certificate of incorporation.
	With regards to the amended and restated by-laws of Synlogic, the second amended and restated certificate of incorporation of Synlogic states that holders of 66 and 2/3% of all then outstanding shares of Synlogic Preferred Stock must affirmatively vote or consent in writing to the amendment, alteration or repeal of any provision of the amended and restated by-laws of Synlogic. In addition, the second amended and restated certificate of incorporation of Synlogic states that the Synlogic Board of Directors is expressly authorized to make, repeal, alter, amend and rescind any or all of the amended and restated by-laws of Synlogic, subject to any additional vote required by the second amended and restated certificate of incorporation of Synlogic or the amended and restated by-laws of Synlogic.	With regards to the amended and restated bylaws of Mirna, the amended and restated articles of incorporation state that the Mirna Board of Directors is expressly authorized to make, alter or repeal the amended and restated bylaws of Mirna. Additionally, and in addition to any vote of the holders of any class or series of stock of Mirna required by law or by the amended and restated certificate of incorporation, the adoption, amendment or repeal of the amended and restated bylaws by the Mirna Stockholders shall require the affirmative vote of the holders of at least 66 and 2/3% of the voting power of all the then-outstanding shares of the voting stock, voting together as a single class.
	The amended and restated by-laws of Synlogic provide that the by-laws may be amended, added to, rescinded or repealed by the Synlogic Stockholders or by the Synlogic Board of Directors, when such power is conferred upon the Synlogic Board of Directors by the then current certificate of incorporation, at any meeting of the Synlogic Stockholders or of the Synlogic Board of Directors, provided notice of the proposed change was given in the notice of the meeting or, in the case of a meeting of the Synlogic Board of Directors, in a notice given not less than two days prior to the meeting.	

PRINCIPAL STOCKHOLDERS OF MIRNA

Except where specifically noted, the following information and all other information contained in this proxy statement/prospectus/information statement do not give effect to the proposed Reverse Stock Split described in Proposal No. 2.

The following table sets forth information relating to the beneficial ownership of Mirna Common Stock as of May 31, 2017:

- by each person, or group of affiliated persons, known by Mirna to beneficially own more than 5% of the outstanding shares of Mirna Common Stock;
- each of Mirna's directors and nominees for director;
- each of Mirna's NEOs; and
- all directors, nominees and executive officers as a group.

The number of shares beneficially owned by each entity, person, director, nominee or executive officer is determined in accordance with the rules of the SEC, and the information is not necessarily indicative of beneficial ownership for any other purpose. Under such rules, beneficial ownership includes any shares over which the individual has sole or shared voting power or investment power as well as any shares that the individual has the right to acquire within 60 days of May 31, 2017 through the exercise of stock options or other rights. Except as otherwise indicated, and subject to applicable community property laws, the persons named in the table have sole voting and investment power with respect to all shares of common stock held by that person.

The percentage of shares beneficially owned is computed on the basis of 20,856,693 shares of Mirna Common Stock outstanding as of May 31, 2017. Shares of Mirna Common Stock that a person has the right to acquire within 60 days of May 31, 2017 are deemed outstanding for purposes of computing the percentage ownership of the person holding such rights, but are not deemed outstanding for purposes of computing the percentage ownership of any other person, except with respect to the percentage ownership of all directors and executive officers as a group. Unless otherwise indicated below, the address for each beneficial owner listed is c/o Mirna Therapeutics, Inc., at 1250 S Capital of Texas Highway, Building 3, Suite 400, Austin, TX 78746.

	Beneficial Ownership			
Name and Address of Beneficial Owner	Number of Outstanding Shares Beneficially Owned	Number of Shares Exercisable Within 60 Days	Number of Shares Beneficially Owned	Percentage of Beneficial Ownership
5% and Greater Stockholders				
Sofinnova Venture Partners VIII, L.P.(1)	2,974,812	—	2,974,812	14.3%
Entities Associated with New Enterprise Associates(2)	2,971,517	—	2,971,517	14.2%
Pfizer Inc.(3)	2,497,586	—	2,497,586	12.0%
Cancer Prevention and Research Institute of Texas(4)	2,395,010	—	2,395,010	11.5%
Franklin Resources(5)	1,384,073	—	1,384,073	6.6%
Eastern Capital Limited(6)	1,118,741	—	1,118,741	5.4%
Named Executive Officers and Directors				
Paul Lammers, M.D., M.Sc.(7)	22,287	363,681	385,968	1.9%
Alan Fuhrman(8)	—	96,623	96,623	*
Vincent O'Neill, M.D.(9)	—	250,000	250,000	*
Miguel Barbosa, Ph.D.	—	—	—	*
Jon Irvin(10)	5,985	81,716	87,701	*
Michael Powell, Ph.D.(11)	2,974,812	16,400	2,991,212	14.3%
Lawrence M. Alleva(12)	4,025	29,510	33,535	*
Peter S. Greenleaf(13)	—	16,667	16,667	*
Edward Mathers(14)	—	14,800	14,800	*
Perry Nisen M.D., Ph.D.(15)	—	6,667	6,667	*
Matthew Winkler, Ph.D.(16)	649,174	14,800	663,974	3.2%
All directors and executive officers as a group (9 persons)(17)	3,650,298	638,209	4,288,507	20.0%

* Indicates beneficial ownership of less than 1% of the total outstanding shares of Mirna Common Stock.

(1) As reported on Schedule 13D, filed with the SEC on October 8, 2015 by Sofinnova Ventures Partners VIII, L.P. ("SVP VIII"), Sofinnova Management VIII, L.L.C. ("SM VIII"), Dr. Srinivas Akkaraju, Dr. Michael F. Powell, Dr. James I. Healy, and Dr. Anand Mehra. SM VIII is the general partner of SVP VIII. The individual Managers, or the Managing Members, of SVP VIII are Michael Powell, James Healy, Srinivas Akkaraju and Anand Mehra. The Managers may be deemed to have shared voting and dispositive power with regard to the shares of Mirna Common Stock held directly by SVP VIII. The address of SVP VIII is 3000 Sand Hill Road, Bldg. 4, Suite 250, Menlo Park, CA 94025.

(2) As reported on Schedule 13D/A, filed with the SEC on May 16, 2017 by New Enterprise Associates 14, L.P. ("NEA 14"), NEA Partners 14, L.P. ("NEA Partners 14"), NEA 14 GP, LTD ("NEA 14 LTD"), M. James Barrett, Peter J. Barris, Forest Baskett, Anthony A. Florence, Jr., Patrick J. Kerins, Krishna S. Kolluri, David M. Mott, Scott D. Sandell, Peter W. Sonsini, Ravi Viswanathan and Harry R. Weller. The shares of Mirna Common Stock directly held by NEA 14 are indirectly held by NEA Partners 14, the sole general partner of NEA 14. NEA 14 LTD is the sole general partner of NEA Partners 14. The individual Managers, or the Managers, of NEA 14 LTD are M. James Barrett, Peter J. Barris, Forest Baskett, Ryan D. Drant, Anthony A. Florence, Jr., Patrick J. Kerins, Krishna Kolluri, David M. Mott, Scott D. Sandell, Peter Sonsini, Ravi Viswanathan and Harry R. Weller. The Managers share voting and dispositive power with regard to shares held directly by NEA 14. The address of NEA 14 is 1954 Greenspring Drive, Suite 600, Timonium, MD 21903.

(3) As reported on Schedule 13G/A, filed with the SEC on February 11, 2016 by Pfizer, Inc. The address for this entity is 235 E. 42nd Street, New York, NY 10017.
(4) As reported on Schedule 13G, filed with the SEC on October 8, 2015, by Cancer Prevention and Research Institute of Texas. The address for this entity is 1701 N. Congress Avenue, Suite 6-127 Austin, TX 78701.
(5) As reported on Schedule 13G/A, filed with the SEC on February 9, 2017 by Franklin Resources, Inc. ("FRI"), Charles B. Johnson ("Charles Johnson"), Rupert H. Johnson, Jr. ("Rupert Johnson") and Franklin Advisers, Inc. ("Advisers"). Charles Johnson and Rupert Johnson each own in excess of 10% of the outstanding common stock of FRI and are the principal stockholders of FRI. Accordingly, FRI, Charles Johnson and Rupert Johnson may be deemed to be the beneficial owners of securities held by persons and entities for whom or for which FRI subsidiaries provide investment management services. FRI, Charles Johnson and Rupert Johnson disclaim any pecuniary interest in any of the securities. The address of FRI, Charles Johnson, Rupert Johnson and Advisers is One Franklin Parkway, San Mateo, CA 94403-1906.
(6) As reported on Schedule 13G, filed with the SEC on October 15, 2015 by Eastern Capital Limited, Portfolio Services Ltd. and Kenneth B. Dart. Eastern Capital Limited is a Cayman Islands corporation. Portfolio Services Ltd., a Cayman Islands corporation, owns all of the outstanding stock of Eastern Capital Limited. Kenneth B. Dart is the beneficial owner of all of the outstanding stock of Portfolio Services Ltd. Kenneth B. Dart is a director of both Eastern Capital Limited and Portfolio Services Ltd. The address for these entities is 10 Market Street #773, Camana Bay, Grand Cayman, KY1-9006, Cayman Islands.
(7) Consists of: (i) 363,681 shares of Mirna Common Stock that may be acquired pursuant to the exercise of stock options within 60 days of May 31, 2017 by Dr. Lammers and (ii) 22,287 shares held by Dr. Lammers.
(8) Consists of 96,623 shares of Mirna Common Stock that may be acquired pursuant to the exercise of stock options within 60 days of May 31, 2017.
(9) Consists of 250,000 shares of Mirna Common Stock that may be acquired pursuant to the exercise of stock options within 60 days of May 31, 2017.
(10) Consists of (i) 81,716 shares of Mirna Common Stock that may be acquired pursuant to the exercise of stock options within 60 days of May 31, 2017 by Mr. Irvin and (ii) 5,985 shares held by Mr. Irvin.
(11) Consists of (i) 2,974,812 shares of Mirna Common Stock held by SVP VIII as reported in footnote 1 above and (ii) 16,400 shares that may be acquired pursuant to the exercise of stock options within 60 days of May 31, 2017.
(12) Consists of: (i) 29,510 shares of Mirna Common Stock that may be acquired pursuant to the exercise of stock options within 60 days of May 31, 2017 by Mr. Alleva and (ii) 4,025 shares held by the Lawrence M. Alleva Profit Sharing Plan.
(13) Consists of 16,667 shares of Mirna Common Stock that may be acquired pursuant to the exercise of stock options within 60 days of May 31, 2017.
(14) Consists of 14,800 shares of Mirna Common Stock that may be acquired pursuant to the exercise of stock options within 60 days of May 31, 2017.
(15) Consists of 6,667 shares of Mirna Common Stock that may be acquired pursuant to the exercise of stock options within 60 days of May 31, 2017
(16) Consists of: (i) 14,800 shares of Mirna Common Stock that may be acquired pursuant to the exercise of stock options within 60 days of May 31, 2017 by Mr. Winkler and (ii) 649,174 shares held by Mr. Winkler.
(17) Includes: (i) 3,650,298 shares of Mirna Common Stock held by Mirna's executive officers, entities affiliated with Dr. Powell and the Lawrence M. Alleva Profit Sharing Plan and (ii) 638,209 shares of Mirna Common Stock that may be acquired by Mirna's current executive officers and directors pursuant to the exercise of stock options within 60 days of May 31, 2017.

PRINCIPAL STOCKHOLDERS OF SYNLOGIC

The following table sets forth information relating to the beneficial ownership of Synlogic Common Stock, on an as converted to common stock basis, as of May 31, 2017 for:

- each person, or group of affiliated persons, known by Synlogic to beneficially own more than 5% of Synlogic's outstanding shares of Synlogic capital stock;
- each of Synlogic's directors;
- each of Synlogic's named executive officers; and
- all directors and executive officers of Synlogic as a group.

The number of shares beneficially owned by each entity, person, director or executive officer is determined in accordance with the rules of the SEC, and the information is not necessarily indicative of beneficial ownership for any other purpose. Under such rules, beneficial ownership includes any shares over which the individual has sole or shared voting power or investment power as well as any shares that the individual has the right to acquire within 60 days of May 31, 2017 through the exercise of stock options or other rights. Except as otherwise indicated, and subject to applicable community property laws, the persons named in the table have sole voting and investment power with respect to all shares of capital stock held by that person.

The percentage of shares beneficially owned is computed on the basis of 24,052,159 shares of Synlogic Common Stock outstanding as of May 31, 2017. This number assumes the conversion of all 19,139,503 shares of Synlogic Preferred Stock outstanding as of May 31, 2017 into 19,139,503 shares of Synlogic Common Stock and includes 4,912,656 shares of Synlogic Common Stock outstanding as of May 31, 2017. Shares of Synlogic Common Stock that a person has the right to acquire within 60 days of May 31, 2017 are deemed outstanding for purposes of computing the percentage ownership of the person holding such rights, but are not deemed outstanding for purposes of computing the percentage ownership of any other person, except with respect to the percentage ownership of all directors and executive officers as a group. Unless otherwise indicated below, the address for each beneficial owner listed is c/o Synlogic, Inc., at 200 Sidney Street, Suite 320, Cambridge, MA 02139.

	Beneficial Ownership			
Name and Address of Beneficial Owner	Number of Outstanding Shares Beneficially Owned	Number of Shares Exercisable Within 60 Days	Number of Shares Beneficially Owned	Percentage of Beneficial Ownership
5% and Greater Stockholders				
New Enterprise Associates 14, L.P.(1)	6,136,008	—	6,136,008	25.5%
Atlas Venture Fund IX, L.P.(2)	4,793,861	—	4,793,861	19.9%
OrbiMed Private Investments VI, L.P.(3)	2,377,073	—	2,377,073	9.9%
Deerfield Private Design Fund III, L.P.(4)	1,536,774	—	1,536,774	6.4%
Bill & Melinda Gates Foundation(5)	1,413,039	—	1,413,039	5.9%
Entities affiliated with Perceptive Advisors(6)	1,240,695	—	1,240,695	5.2%
Named Executive Officers and Directors				
Jose Carlos Gutierrez-Ramos, Ph.D.(7)	655,494	12,500	667,994	2.8%
Paul Miller, Ph.D.(8)	135,819	15,927	151,746	*
Aoife M. Brennan, MB, BCh, BAO, MMSc(9)	93,578	3,124	96,702	*
Nick Leschly(10)	41,849	11,427	53,276	*
Peter Barrett, Ph.D.(11)	4,793,861	—	4,793,861	19.9%
Edward Mathers	—	—	—	*
Chau Khuong(12)	2,377,073	—	2,377,073	9.9%
All directors and executive officers as a group (10 persons)(13)	8,327,654	47,058	8,374,712	34.75%

* Indicates beneficial ownership of less than 1% of the total outstanding shares of Synlogic Common Stock.

(1) Consists of (i) 727,272 shares of Synlogic Common Stock issuable upon conversion of 727,272 shares of Series A-1 preferred stock, (ii) 1,185,714 shares of Synlogic Common Stock issuable upon conversion of 1,185,714 shares of Series A-2 preferred stock, (iii) 2,149,999 shares of Synlogic Common Stock issuable upon conversion of 2,149,999 shares of Series A-3 preferred stock, (iv) 1,576,745 shares of Synlogic Common Stock issuable upon conversion of 1,576,745 shares of Series B preferred stock, and (v) 496,278 shares of Synlogic Common Stock issuable upon conversion of 496,278 shares of Series C preferred stock. All shares are directly held by New Enterprise Associates 14, L.P., or NEA 14. NEA Partners 14, L.P., or NEA Partners 14, is the sole general partner of NEA 14. NEA 14 GP, LTD, or NEA 14 LTD, is the sole general partner of NEA Partners 14. The individual Managers, or the Managers, of NEA 14 LTD are M. James Barrett, Peter J. Barris, Forest Baskett, Ryan D. Drant, Anthony A. Florence, Jr., Patrick J. Kerins, Krishna Kolluri, David M. Mott, Scott D. Sandell, Peter Sonsini, Ravi Viswanathan and Harry R. Weller. The Managers share voting and dispositive power with regard to shares held directly by NEA 14. The address of NEA 14 is 1954 Greenspring Drive, Suite 600, Timonium, MD 21903.

(2) Consists of (i) 500,000 shares of Synlogic Common Stock, (ii) 559,770 shares of Synlogic Common Stock issuable upon conversion of 559,770 shares of Series A-1 preferred stock, (iii) 790,476 shares of Synlogic Common Stock issuable upon conversion of 790,476 shares of Series A-2 preferred stock, (iv) 1,474,998 shares of Synlogic Common Stock issuable upon conversion of 1,474,998 shares of Series A-3 preferred stock, (v) 1,096,408 shares of Synlogic Common Stock issuable upon conversion of 1,096,408 shares of Series B preferred stock, and (vi) 372,209 shares of Synlogic Common Stock issuable upon conversion of 372,209 shares of Series C preferred stock. All shares are held directly by Atlas Venture Fund IX, L.P., or Atlas Venture Fund IX. Atlas Venture Associates IX, L.P., or AVA IX LP, is the general partner of Atlas Venture Fund IX, and Atlas Venture Associates IX, LLC, or AVA IX LLC, is the general partner of AVA IX LP. Peter Barrett, Bruce Booth, Jean-Francois Formela, Jeff Fagnan, Chris Lynch and Ryan Moore are the members of AVA IX LLC and collectively make investment decisions on behalf of Atlas Venture Fund IX, and each is a director of AVA IX LLC. Dr. Barrett is also a member of Synlogic's board of directors. Dr. Barrett disclaims beneficial ownership of such shares, except to the extent of his proportionate pecuniary interest therein, if any. The address for Atlas Venture Fund IX is 25 First Street, Suite 303, Cambridge, MA 02141.

(3) Consists of (i) 2,004,864 shares of Synlogic Common Stock issuable upon conversion of 2,004,864 shares of Series B preferred stock and (ii) 372,209 shares of Synlogic Common Stock issuable upon conversion of 372,209 shares of Series C preferred stock. All shares are held directly by OrbiMed Private Investments VI, L.P., or OPI VI. OrbiMed Capital GP VI LLC, or GP VI, is the general partner of OPI VI. By virtue of such relationships, GP VI, OrbiMed and Mr. Isaly may be deemed to have voting and investment power with respect to the shares held by OPI VI and as a result may be deemed to have beneficial ownership of such shares. Chau Khuong is employed as a Private Equity Partner at OrbiMed. Each of GP VI, OrbiMed, Mr. Isaly and Mr. Khuong disclaims beneficial ownership of the shares held by OPI VI, except to the extent of its or his pecuniary interest therein, if any. The address of OPI VI is 601 Lexington Avenue, 54th Floor, New York, New York 10022.

(4) Consists of (i) 668,287 shares of Synlogic Common Stock issuable upon conversion of 668,287 shares of Series B preferred stock and (ii) 868,487 shares of Synlogic Common Stock issuable upon conversion of 868,487 shares of Series C preferred stock. Deerfield Mgmt III, L.P., or Deerfield Mgmt III, is the general partner of Deerfield Private Design Fund III, L.P, or Deerfield PDF III. Deerfield Management Company, L.P., or Deerfield Management Co., is the investment manager of Deerfield PDF III. James E. Flynn is the sole member of the general partner of Deerfield Mgmt III and Deerfield Management Co. Deerfield Mgmt III, Deerfield Mgmt III, Deerfield Management Co. and Mr. James E. Flynn may be deemed to beneficially own the shares held by Deerfield PDF III. The address of Deerfield PDF III is 780 Third Avenue, 37th Floor, New York, NY 10017.

(5) Consists of (i) 363,636 shares of Synlogic Common Stock issuable upon conversion of 363,636 shares of Series A-1 preferred stock, (ii) 395,238 shares of Synlogic Common Stock issuable upon conversion of 395,238 shares of Series A-2 preferred stock, and (iii) 654,165 shares of Synlogic Common Stock issuable

upon conversion of 654,165 shares of Series A-3 preferred stock. The mailing address of the Bill & Melinda Gates Foundation is P.O. Box 23350, Seattle, WA 98102.

(6) Consists of (i) 1,210,422 shares of Synlogic Common Stock issuable upon conversion of 1,210,422 shares of Series C preferred stock held by Perceptive Life Sciences Master Fund, Ltd, or Perceptive, and (ii) 30,273 shares of Synlogic Common Stock issuable upon conversion of 30,273 shares of Series C preferred stock held by Titan Perc Ltd, or Titan Perc. Perceptive Advisors LLC is the advisor of Perceptive and Titan Perc, and Joseph Edelman is the managing member of Perceptive Advisors LLC. Perceptive Advisors LLC and Mr. Edelman may be deemed to beneficially own the shares held by Perceptive and Titan Perc. The address of Perceptive is 51 Astor Place, 10th Floor, New York, NY 10003. The address of Titan Perc is 750 Washington Blvd., 10th Floor, Stamford, CT 06901.

(7) Consists of (i) 655,494 shares of Synlogic Common Stock held by Dr. Gutierrez-Ramos subject to a restricted stock agreement and (ii) 12,500 shares of Synlogic Common Stock that may be acquired pursuant to the exercise of Synlogic Options within 60 days of May 31, 2017.

(8) Consists of (i) 135,819 shares of Synlogic Common Stock held by Dr. Miller subject to a restricted stock agreements and (ii) 15,927 shares of Synlogic Common Stock that may be acquired pursuant to the exercise of Synlogic Options within 60 days of May 31, 2017.

(9) Consists of (i) 93,578 shares of Synlogic Common Stock held by Dr. Brennan subject to a restricted stock agreement and (ii) 3,124 shares of Synlogic Common Stock that may be acquired pursuant to the exercise of Synlogic Options within 60 days of May 31, 2017.

(10) Consists of (i) 41,849 shares of Synlogic Common Stock held by Mr. Leschly subject to a restricted stock agreement and (ii) 11,427 shares of Synlogic Common Stock that may be acquired pursuant to the exercise of Synlogic Options within 60 days of May 31, 2017.

(11) Consists of (i) 500,000 shares of Synlogic Common Stock, (ii) 559,770 shares of Synlogic Common Stock issuable upon conversion of 559,770 shares of Series A-1 preferred stock, (iii) 790,476 shares of Synlogic Common Stock issuable upon conversion of 790,476 shares of Series A-2 preferred stock, (iv) 1,474,998 shares of Synlogic Common Stock issuable upon conversion of 1,474,998 shares of Series A-3 preferred stock, (v) 1,096,408 shares of Synlogic Common Stock issuable upon conversion of 1,096,408 shares of Series B preferred stock, and (vi) 372,209 shares of Synlogic Common Stock issuable upon conversion of 372,209 shares of Series C preferred stock described in note (2) above. Dr. Barrett is a general partner of Atlas Venture Fund IX, L.P., and as such Dr. Barrett may be deemed to share voting and dispositive power with respect to all shares held by such entity. Dr. Barrett disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. Dr. Barrett's business address is 400 Technology Square, 10th Floor, Cambridge, MA 02139.

(12) Consists of (i) 2,004,864 shares of Synlogic Common Stock issuable upon conversion of 2,004,864 shares of Series B preferred stock and (ii) 372,209 shares of Synlogic Common Stock issuable upon conversion of 372,209 shares of Series C preferred stock described in note (3) above. GP VI, OrbiMed and Mr. Isaly may be deemed to have voting and investment power with respect to the shares held by OPI VI and as a result may be deemed to have beneficial ownership of such shares. Mr. Khuong is employed as a Private Equity Partner at OrbiMed. Each of GP VI, OrbiMed, Mr. Isaly and Mr. Khuong disclaims beneficial ownership of the shares held by OPI VI, except to the extent of its or his pecuniary interest therein, if any. Mr. Khuong's business address is 601 Lexington Avenue, 54th Floor, New York, New York 10022.

(13) Consists of (i) 1,156,720 shares of Synlogic Common Stock held by Synlogic's executive officers and directors, and (ii) 47,058 shares of Synlogic Common Stock that may be acquired by Synlogic's current executive officers and directors pursuant to the exercise of Synlogic Options within 60 days of May 31, 2017.

PRINCIPAL STOCKHOLDERS OF THE COMBINED ORGANIZATION

Except where specifically noted, the following information and all other information contained in this proxy statement/prospectus/information statement do not give effect to the proposed Reverse Stock Split described in Mirna Proposal No. 2.

The following table and the related notes present certain information with respect to the beneficial ownership of Mirna Common Stock upon consummation of the Merger, assuming the Closing occurs on August 15, 2017, by:

- each person, or group of affiliated persons, expected by Mirna or Synlogic to become the beneficial owner of more than 5% of the outstanding shares of Mirna Common Stock upon consummation of the Merger;
- each of the combined organization's directors and nominees for director;
- each of the combined organization's named executive officers; and
- all directors, nominees and executive officers of the combined organization as a group.

The number of shares of Mirna Common Stock beneficially owned by each entity, person, director, nominee or executive officer is determined in accordance with the rules of the SEC, and the information is not necessarily indicative of beneficial ownership for any other purpose. Under such rules, beneficial ownership includes any shares over which the individual has sole or shared voting power or investment power as well as any shares that the individual has the right to acquire within 60 days of August 15, 2017 through the exercise of stock options or other rights. Except as otherwise indicated, and subject to applicable community property laws, the persons named in the table have sole voting and investment power with respect to all shares of capital stock held by that person.

The following table assumes that the Mirna Closing Price will be $1.42 per share (which was the average closing trading price of Mirna Common Stock over the first five business days following the public announcement of the transaction) such that all Mirna Options will be terminated and cease to exist as of immediately prior to the Effective Time for no consideration pursuant to the Merger Agreement. The following table further assumes that Mirna will have 20,856,693 shares of Mirna Common Stock outstanding following the termination of such Mirna Options and as of immediately prior to the Effective Time, and that Synlogic will have 25,221,865 shares of Synlogic Capital Stock outstanding as of immediately prior to the Effective Time. Based on the assumed capitalization of Mirna and Synlogic immediately prior to the Effective Time as set forth above, and further assuming that Mirna's net cash immediately prior to the Effective Time is $40 million, the Exchange Ratio will be 4.0807 and at the Effective Time each share of Synlogic Capital Stock will be converted into the right to receive an aggregate of 102,922,790 shares of Mirna Common Stock. Neither the assumed capitalization nor the assumed Exchange Ratio set forth above give effect to the Reverse Stock Split. Shares of Mirna Common Stock that may be acquired by an individual or group within 60 days of August 15, 2017, pursuant to the exercise of options or warrants, are deemed to be outstanding for the purpose of computing the percentage ownership of such individual or group, but are not deemed to be outstanding for the purpose of computing the percentage ownership of Mirna Common Stock of any other person shown in the table. Unless otherwise indicated below, the address for each beneficial owner listed is c/o Synlogic, Inc., at 200 Sidney Street, Suite 320, Cambridge, MA 02139.

	Beneficial Ownership			
Name and Address of Beneficial Owner	Number of Outstanding Shares Beneficially Owned	Number of Shares Exercisable Within 60 Days	Number of Shares Beneficially Owned	Percentage of Beneficial Ownership
5% and Greater Stockholders				
New Enterprise Associates 14, L.P.(1)	28,010,724	—	28,010,724	23.5%
Atlas Venture Fund IX, L.P.(2)	19,562,308	—	19,562,308	16.4%
OrbiMed Private Investments VI, L.P.(3)	9,700,121	—	9,700,121	8.2%
Deerfield Private Design Fund III, L.P.(4)	6,271,113	—	6,271,113	5.3%
Named Executive Officers and Directors				
Jose Carlos Gutierrez-Ramos, Ph.D.(5)	2,674,874	102,016	2,776,890	2.3%
Paul Miller, Ph.D.(6)	554,236	78,552	632,788	*
Aoife M. Brennan, MB, BCh, BAO, MMSc(7)	381,863	110,236	492,099	*
Nick Leschly(8)	170,773	52,462	223,235	*
Edward Mathers	—	—	—	*
Peter Barrett, Ph.D.(9)	19,562,308	—	19,562,308	16.4%
Chau Khuong(10)	9,700,121	—	9,700,121	8.2%
Michael Powell, Ph.D.(11)	2,974,812	—	2,974,812	2.5%
All directors and executive officers as a group (11 persons)(12)	36,957,465	575,388	37,532,853	31.4%

* Indicates beneficial ownership of less than 1% of the total outstanding shares of Mirna Common Stock.

(1) Consists of 28,010,724 shares of Mirna Common Stock. All shares are directly held by New Enterprise Associates 14, L.P. ("NEA 14"). NEA Partners 14, L.P. ("NEA Partners 14") is the sole general partner of NEA 14. NEA 14 GP, LTD ("NEA 14 LTD") is the sole general partner of NEA Partners 14. The individual Managers, or the Managers, of NEA 14 LTD are M. James Barrett, Peter J. Barris, Forest Baskett, Ryan D. Drant, Anthony A. Florence, Jr., Patrick J. Kerins, Krishna Kolluri, David M. Mott, Scott D. Sandell, Peter Sonsini, Ravi Viswanathan and Harry R. Weller. The Managers share voting and dispositive power with regard to shares held directly by NEA 14. The address of NEA 14 is 1954 Greenspring Drive, Suite 600, Timonium, MD 21903.

(2) Consists of 19,562,308 shares of Mirna Common Stock. All shares are held directly by Atlas Venture Fund IX, L.P. ("Atlas Venture Fund IX"). Atlas Venture Associates IX, L.P. ("AVA IX LP") is the general partner of Atlas Venture Fund IX, and Atlas Venture Associates IX, LLC ("AVA IX LLC") is the general partner of AVA IX LP. Peter Barrett, Bruce Booth, Jean-Francois Formela, Jeff Fagnan, Chris Lynch and

Ryan Moore are the members of AVA IX LLC and collectively make investment decisions on behalf of Atlas Venture Fund IX, and each is a director of AVA IX LLC. Dr. Barrett is also a member of the Synlogic Board of Directors. Dr. Barrett disclaims beneficial ownership of such shares, except to the extent of his proportionate pecuniary interest therein, if any. The address for Atlas Venture Fund IX is 25 First Street, Suite 303, Cambridge, MA 02141.

(3) Consists of 9,700,121 shares of Mirna Common Stock. All shares are held directly by OrbiMed Private Investments VI, L.P. ("OPI VI"). OrbiMed Capital GP VI LLC ("GP VI") is the general partner of OPI VI. OrbiMed Advisors LLC ("OrbiMed") is the managing member of GP VI. Samuel D. Isaly is the managing member of and owner of a controlling interest in OrbiMed. By virtue of such relationships, GP VI, OrbiMed and Mr. Isaly may be deemed to have voting and investment power with respect to the shares held by OPI VI and as a result may be deemed to have beneficial ownership of such shares. Chau Khuong is employed as a Private Equity Partner at OrbiMed. Each of GP VI, OrbiMed, Mr. Isaly and Mr. Khuong disclaims beneficial ownership of the shares held by OPI VI, except to the extent of its or his pecuniary interest therein, if any. The address of OPI VI is 601 Lexington Avenue, 54th Floor, New York, New York 10022.

(4) Consists of 6,271,113 shares of Mirna Common Stock. Deerfield Mgmt III, L.P. ("Deerfield Mgmt III") is the general partner of Deerfield Private Design Fund III, L.P. ("Deerfield PDF III"). Deerfield Management Company, L.P. ("Deerfield Management Co.") is the investment manager of Deerfield PDF III. James E. Flynn is the sole member of the general partner of Deerfield Mgmt III and Deerfield Management Co. Deerfield Mgmt III, Deerfield Mgmt III, Deerfield Management Co. and Mr. James E. Flynn may be deemed to beneficially own the shares held by Deerfield PDF III. The address of Deerfield PDF III is 780 Third Avenue, 37th Floor, New York, NY 10017.

(5) Consists of 2,674,874 shares of Mirna Common Stock held by Dr. Gutierrez-Ramos subject to a restricted stock agreement and (ii) 102,016 shares of Mirna Common Stock that may be acquired pursuant to the exercise of options to purchase Mirna Common Stock within 60 days of August 15, 2017.

(6) Consists of 554,236 shares of Mirna Common Stock held by Dr. Miller subject to restricted stock agreements and (ii) 78,552 shares of Mirna Common Stock that may be acquired pursuant to the exercise of options to purchase Mirna Common Stock within 60 days of August 15, 2017.

(7) Consists of 381,863 shares of Mirna Common Stock held by Dr. Brennan subject to a restricted stock agreement and (ii) 110,236 shares of Mirna Common Stock that may be acquired pursuant to the exercise of options to purchase Mirna Common Stock within 60 days of August 15, 2017.

(8) Consists of 170,773 shares of Mirna Common Stock held by Mr. Leschly subject to a restricted stock agreement and (ii) 52,462 shares of Mirna Common Stock that may be acquired pursuant to the exercise of options to purchase Mirna Common Stock within 60 days of August 15, 2017.

(9) Consists of 19,562,308 shares of Mirna Common Stock described in note (2) above. Dr. Barrett is a general partner of Atlas Venture Fund IX, and as such Dr. Barrett may be deemed to share voting and dispositive power with respect to all shares held by such entity. Dr. Barrett disclaims beneficial ownership of such shares except to the extent of any pecuniary interest therein. Dr. Barrett's business address is 400 Technology Square, 10th Floor, Cambridge, MA 02139.

(10) Consists of 9,700,121 shares of Mirna Common Stock described in note (3) above. GP VI, OrbiMed and Mr. Isaly may be deemed to have voting and investment power with respect to the shares held by OPI VI and as a result may be deemed to have beneficial ownership of such shares. Mr. Khuong is employed as a Private Equity Partner at OrbiMed. Each of GP VI, OrbiMed, Mr. Isaly and Mr. Khuong disclaims beneficial ownership of the shares held by OPI VI, except to the extent of its or his pecuniary interest therein, if any. Mr. Khuong's business address is 601 Lexington Avenue, 54th Floor, New York, New York 10022.

(11) Consists of 2,974,812 shares of Mirna Common Stock held by Sofinnova Ventures Partners VIII, L.P. ("SVP VIII"). Sofinnova Management VIII, L.L.C. is the general partner of SVP VIII. The individual Managers, or the Managing Members, of SVP VIII are Michael Powell, James Healy, Srinivas Akkaraju and Anand Mehra. The Managers may be deemed to have shared voting and dispositive power with regard to the shares of Mirna Common Stock held directly by SVP VIII. The address of SVP VIII is 3000 Sand Hill Road, Bldg. 4, Suite 250, Menlo Park, CA 94025.

(12) Consists of (i) 37,532,853 shares of Mirna Common Stock beneficially held by the combined organization's executive officers and directors, and (ii) 575,388 shares of Mirna Common Stock that may be acquired by Synlogic's current executive officers and directors pursuant to the exercise of options to purchase Mirna Common Stock within 60 days of August 15, 2017.

LEGAL MATTERS

Latham & Watkins LLP will pass upon the validity of the Mirna Common Stock offered by this proxy statement/prospectus/information statement.

EXPERTS

The financial statements of Mirna Therapeutics, Inc. at December 31, 2015 and 2016, and for each of the three years in the period ended December 31, 2016, included in this proxy statement of Mirna Therapeutics, Inc., which is referred to and made a part of this prospectus and registration statement, have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their report appearing elsewhere herein, and are included in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

The consolidated financial statements of Synlogic, LLC at December 31, 2015 and 2016, and for the years then ended, have been included herein in reliance upon the report of KPMG LLP, independent registered public accounting firm, appearing elsewhere herein, and upon the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

Mirna files annual, quarterly and current reports, proxy statements and other information with the SEC. You may read and copy any reports, statements or other information that Mirna files at the SEC public reference room in at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the public reference rooms. Mirna SEC filings are also available to the public from commercial document retrieval services and on the website maintained by the SEC at http://www.sec.gov. Reports, proxy statements and other information concerning Mirna also may be inspected at the offices of the National Association of Securities Dealers, Inc., Listing Section, 1735 K Street, Washington, D.C. 20006.

As of the date of this proxy statement/prospectus/information statement, Mirna has filed a registration statement on Form S-4 to register with the SEC the Mirna Common Stock that Mirna will issue to Synlogic Stockholders in the Merger. This proxy statement/prospectus/information statement is a part of that registration statement and constitutes a prospectus of Mirna, as well as a proxy statement of Mirna for the Annual Meeting and an information statement for the purpose of Synlogic for its written consent.

Mirna has supplied all information contained in this proxy statement/prospectus/information statement relating to Mirna, and Synlogic has supplied all information contained in this proxy statement/prospectus/information statement relating to Synlogic.

If you would like to request documents from Mirna or Synlogic, please send a request in writing or by telephone to either Mirna or Synlogic at the following addresses:

Mirna Therapeutics, Inc.
PO Box 163387
Austin, TX 78716
Telephone: (512) 901-0950
Attn: Chief Financial Officer

Synlogic, Inc.
200 Sidney Street, Suite 320
Cambridge, MA 02139
Telephone: (617) 401-9947
Attn: Chief Financial Officer

TRADEMARK NOTICE

"Mirna Therapeutics, Inc.®" and the Mirna logo are registered trademarks of Mirna in the United States and other jurisdictions. "Synlogic™," "Synthetic Biotics™" and the Synlogic logo are unregistered trademarks of Synlogic. Other third-party logos and product/trade names are registered trademarks or trade names of their respective companies.

OTHER MATTERS

Stockholder Proposals

Mirna Stockholders are entitled to present proposals for action at a forthcoming meeting if they comply with the requirements of the Mirna bylaws and the rules established by the SEC under the Exchange Act. Under these requirements, proposals from Mirna Stockholders that are intended to be presented by such stockholders at the Mirna 2018 annual meeting of stockholders must be addressed to Mirna's Corporate Secretary and received in writing at Mirna's executive offices on or after [●] and no later than [●], unless the date of the 2018 annual meeting of stockholders is more than 30 days before or days after [●], in which case the deadline is a reasonable time before Mirna begins to print and send its proxy materials. If you wish to submit a proposal that is not to be included in the Mirna proxy materials for next year's annual meeting pursuant to the SEC's shareholder proposal procedures or to nominate a director, you must do so no later than [●]; provided that if the date of that annual meeting is more than 30 days before or 60 days after [●], you must give notice not later than the 90th day prior to the annual meeting date and, if later, the 10th day following the day on which public disclosure of the annual meeting date is first made.

Stockholder Communications with the Mirna Board of Directors

Mirna Stockholders may communicate with the Mirna Board of Directors, or an individual director, by sending written correspondence to Mirna's Corporate Secretary at Mirna Therapeutics, Inc., PO Box 163387, Austin, TX 78716. The Corporate Secretary will review such correspondence and forward it to the Mirna Board of Directors, or an individual director, as appropriate.

Householding of Proxy Materials

The SEC has adopted rules known as "householding" that permit companies and intermediaries (such as brokers) to deliver one set of proxy materials to multiple stockholders residing at the same address. This process enables Mirna to reduce Mirna's printing and distribution costs, and reduce Mirna's environmental impact. Householding is available to both Mirna registered stockholders and beneficial owners of Mirna shares held in street name.

Registered Stockholders

If you are a Mirna registered stockholder and have consented to householding, then Mirna will deliver or mail one set of its proxy materials, as applicable, for all registered stockholders residing at the same address. Your consent will continue unless you revoke it, which you may do at any time by providing notice to Mirna's Corporate Secretary by telephone at (512) 901-0950 or by mail at PO Box 163387, Austin, TX 78716.

If you are a registered stockholder who has not consented to householding, then Mirna will continue to deliver or mail copies of Mirna's proxy materials, as applicable, to each registered stockholder residing at the same address. You may elect to participate in householding and receive only one set of proxy materials for all registered stockholders residing at the same address by providing notice to Mirna as described above.

Street Name Holders

Mirna Stockholders who hold their shares through a brokerage may elect to participate in householding, or revoke their consent to participate in householding, by contacting their respective brokers.

Annual Reports

This proxy statement is accompanied by Mirna's 2016 Annual Report on Form 10-K (the "2016 Annual Report"), excluding exhibits. Exhibits to the 2016 Annual Report are available upon payment of a reasonable fee, which is limited to Mirna's expenses in furnishing the requested exhibit. All requests should be directed to Mirna's Corporate Secretary at Mirna Therapeutics Inc., PO Box 163387, Austin, TX 78716.

Mirna has filed the 2016 Annual Report and this proxy statement/prospectus/information statement with the SEC and each is also available in the "Financials & Filings" section on Mirna's investor relations website at http://investor.mirnarx.com/index.cfm and at the SEC's website at www.sec.gov. In addition, upon written request to Mirna's Corporate Secretary at Mirna Therapeutics Inc., PO Box 163387, Austin, TX 78716, Mirna will mail a paper copy of the 2016 Annual Report, including the financial statements and the financial statement schedules, to you free of charge.

MIRNA THERAPEUTICS, INC.
INDEX TO FINANCIAL STATEMENTS

Years Ended December 31, 2016 and 2015 and Three Months Ended March 31, 2017 and 2016

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors and Stockholders of
Mirna Therapeutics, Inc.

We have audited the accompanying balance sheets of Mirna Therapeutics, Inc. ("Mirna") as of December 31, 2016 and 2015, and the related statements of operations, stockholders' equity (deficit), and cash flows for each of the three years in the period ended December 31, 2016. These financial statements are the responsibility of Mirna's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. We were not engaged to perform an audit of Mirna's internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of Mirna's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Mirna Therapeutics, Inc. at December 31, 2016 and 2015, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2016 in conformity with U.S. generally accepted accounting principles.

/s/ Ernst & Young LLP
Austin, Texas
March 14, 2017

MIRNA THERAPEUTICS, INC.

Balance Sheets
(in thousands, except share and per share data)

	December 31, 2016	December 31, 2015
Assets		
Current Assets:		
Cash and cash equivalents	$ 16,432	$ 89,713
Short-term marketable securities	44,066	—
Prepaid expenses and other current assets	882	829
Total current assets	61,380	90,542
Property and equipment, net	354	375
Restricted cash	2,432	—
Total assets	$ 64,166	$ 90,917
Liabilities and Stockholders' Equity (Deficit)		
Current Liabilities:		
Accounts payable	$ 361	$ 3,687
Accrued expenses	2,400	2,214
Total current liabilities	2,761	5,901
Lease obligations, long-term	1,053	—
Total liabilities	$ 3,814	$ 5,901
Stockholders' Equity (Deficit):		
Preferred stock, $0.001 par value, 5,000,000 authorized at December 31, 2016 and 2015; 0 shares outstanding at December 31, 2016 and 2015	—	—
Common stock, $0.001 par value; 250,000,000 shares authorized at December 31, 2016 and 2015; 20,841,393 shares issued and outstanding at December 31, 2016; 20,830,555 shares issued and outstanding at December 31, 2015	21	21
Additional paid in capital	163,126	161,518
Accumulated deficit	(102,791)	(76,523)
Other comprehensive loss	(4)	—
Total stockholders' equity	60,352	85,016
Total liabilities and stockholders' equity	$ 64,166	$ 90,917

The accompanying notes are an integral part of these financial statements.

MIRNA THERAPEUTICS, INC.

Statements of Operations and Comprehensive Loss
(in thousands, except share and per share data)

	Year Ended December 31,		
	2016	2015	2014
Operating expenses:			
Research and development	$ 13,930	$ 18,947	$ 10,545
General and administrative	8,118	6,080	3,369
Restructuring charges	4,442	—	—
Loss on disposal of assets	128	—	—
Write-off of offering costs	—	—	1,920
Total operating expenses	26,618	25,027	15,834
Other income:			
Interest income	350	44	—
Net loss	$ (26,268)	$ (24,983)	$ (15,834)
Less: Accretion and dividends on convertible preferred stock	—	(4,320)	(2,824)
Net loss attributable to common stockholders	$ (26,268)	$ (29,303)	$ (18,658)
Other Comprehensive Loss:			
Unrealized loss on available-for-sale securities, net of tax	$ (4)	$ —	$ —
Total other comprehensive loss	$ (26,272)	$ (29,303)	$ (18,658)
Net loss per share attributable to common stockholders—basic and diluted	$ (1.26)	$ (5.85)	$ (291.00)
Common shares used to compute basic and diluted net loss per share attributable to common stockholders	20,833,963	5,010,323	64,131

The accompanying notes are an integral part of these financial statements.

MIRNA THERAPEUTICS, INC.

Statements of Stockholders' Equity (Deficit)
(in thousands, except share amounts)

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Other Comprehensive Income	Total Stockholder Equity (Deficit)
	Shares	Amount				
Balance at January 1, 2014	2,061	$ —	$ 890	$ (30,804)	—	$ (29,914)
Exercise of stock options	80,816	—	209	—	—	209
Issuance of common stock	448	—	4	—	—	4
Stock-based compensation	—	—	408	—	—	408
Series C dividends	—	—	(1,511)	(1,313)	—	(2,824)
Net loss	—	—	—	(15,834)	—	(15,834)
Balance at December 31, 2014	83,325	—	—	(47,951)	—	(47,951)
Exercise of stock options	28,516	1	66	—	—	67
Stock-based compensation	—	—	985	—	—	985
Accretion of convertible preferred stock	—	—	(180)	(269)	—	(449)
Series C & Series D dividends	—	—	(551)	(3,320)	—	(3,871)
Conversion of preferred stock	11,368,742	11	100,927	—	—	100,938
Initial public offerings of common stock, net of offering costs of $5,021	6,954,962	7	43,657	—	—	43,664
Issuance of common stock in private placement concurrently with initial public offering, net of offering costs of $149	2,395,010	2	16,614	—	—	16,616
Net loss	—	—	—	(24,983)	—	(24,983)
Balance at December 31, 2015	20,830,555	21	161,518	(76,523)	—	85,016
Exercise of stock options	5,313	—	9	—	—	9
Issuance of stock under Employee Stock Purchase Plan	5,525	—	7	—	—	7
Stock-based compensation	—	—	1,592	—	—	1,592
Other comprehensive loss	—	—	—	—	(4)	(4)
Net loss	—	—	—	(26,268)	—	(26,268)
Balance at December 31, 2016	20,841,393	$ 21	$ 163,126	$ (102,791)	(4)	$ 60,352

The accompanying notes are an integral part of these financial statements.

MIRNA THERAPEUTICS, INC.

Statements of Cash Flows
(in thousands)

	Year Ended December 31,		
	2016	2015	2014
Operating activities			
Net loss	$ (26,268)	$ (24,983)	$(15,834)
Adjustment to reconcile net loss to net cash used in operating activities:			
Restructuring charges	4,442	—	—
Depreciation and amortization	159	54	35
Stock-based compensation	1,592	985	408
Issuance of stock for services	—	—	4
Amortization of premiums/ discounts on marketable securities	260	—	—
Loss on disposal of assets	128	—	—
Changes in operating assets and liabilities:			
Grant reimbursement and other receivables	(160)	119	40
Prepaid expenses and other current assets	107	(650)	(99)
Deferred offering costs	—	—	105
Other noncurrent assets	—	—	17
Accounts payable	(3,264)	2,816	189
Accrued expenses	(1,801)	524	1,165
Net cash used in operating activities	(24,805)	(21,135)	(13,970)
Investing activities			
Purchases of marketable securities	(103,114)	—	—
Maturities of marketable securities	58,784	—	—
Restricted cash	(2,432)	—	—
Purchase of property and equipment	(1,729)	(251)	(102)
Net cash used in investing activities	(48,491)	(251)	(102)
Financing activities			
Proceeds from issuance of convertible preferred stock, net of issuance costs	—	41,433	—
Proceeds from the issuance of common stock, net of issuance costs	—	60,280	—
Proceeds from the exercise of stock options	16	67	209
Cash provided by financing activities	16	101,780	209
Net increase (decrease) in cash and cash equivalents	(73,280)	80,394	(13,863)
Cash and cash equivalents at beginning of period	89,713	9,319	23,182
Cash and cash equivalents at end of period	$ 16,432	$ 89,713	$ 9,319
Supplemental disclosure of non-cash investing and financing activities			
Conversion of preferred stock to common stock	$ —	$100,938	$ —

The accompanying notes are an integral part of these financial statements.

MIRNA THERAPEUTICS, INC.

Notes to Financial Statements

1. Organization

Nature of business

Mirna Therapeutics, Inc. ("Mirna" or "the Company") is a biopharmaceutical company focused on microRNA-based oncology therapeutics. The Company was incorporated in Delaware in December 2007 as a wholly-owned subsidiary of Asuragen, Inc. ("Asuragen") and was spun out to existing Asuragen stockholders in December 2009. Following the close of the Company's Phase 1 clinical trial of MRX34 in September 2016, the Company is evaluating its strategic alternatives focusing on enhancing stockholder value, including the possibility of a merger or sale of the Company, and has discontinued further research and development activities (see Note 13) to reduce operating expenses while it evaluates these opportunities. The Company is located in Austin, Texas.

In October 2015, the Company sold 6,250,000 shares of common stock, $0.001 par value per share, in an underwritten public offering (the "IPO") and 2,395,010 shares of common stock in a concurrent private placement, with both offerings at a price of $7.00 per share. The underwriters of the IPO purchased an additional 704,962 shares of common stock pursuant to their option to purchase additional shares. The Company's aggregate net proceeds from the IPO were $43.7 million, after deducting the transaction offering costs and the underwriting discounts incurred. The Company also received net proceeds of $16.7 million after deducting the offering transaction costs from the concurrent private placement.

The Company continues to be subject to a number of risks common to companies in similar stages of development. Principal among these risks are uncertainties of technological innovations, dependence on key individuals, development of the same or similar technological innovations by the Company's competitors and protection of proprietary technology. The Company believes that its cash, cash equivalents and marketable securities of $60.5 million at December 31, 2016 will enable the Company to maintain its current and planned operations for at least the next twelve months.

2. Summary of Significant Accounting Policies

Use of estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires the Company's management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Actual results could differ from those estimates.

Prior to the IPO on October 6, 2015, the Company utilized significant estimates and assumptions in determining the fair value of its common stock. The board of directors determined the estimated fair value of the Company's common stock based on a number of objective and subjective factors, including external market conditions affecting the biotechnology industry sector and the prices at which the Company sold shares of convertible preferred stock, the superior rights and preferences of securities senior to its common stock at the time and the likelihood of achieving a liquidity event, such as an initial public offering or sale of the Company.

Prior to its IPO, the Company utilized various valuation methodologies in accordance with the framework of the American Institute of Certified Public Accountants, or AICPA, Audit and Accounting Practice Aid Series: *Valuation of Privately Held Company Equity Securities Issued as Compensation*, or the AICPA Practice Aid, to estimate the fair value of its common stock. The methodologies included the Option Pricing Method utilizing the Backsolve Method (a form of the market approach defined in the AICPA Practice Aid) and the Probability-Weighted Expected Return Method based upon the probability of occurrence of certain future

liquidity events such as an initial public offering or sale of the Company. Each valuation methodology includes estimates and assumptions that require the Company's judgment. Significant changes to the key assumptions used in the valuations could result in different fair values of common stock at each valuation date.

Research and development costs

Research and development costs consist of costs the Company incurred for its own research and development activities and for preclinical studies and clinical trials. Research and development costs include salaries and personnel-related costs, consulting fees, fees paid for contract research services, the costs of laboratory equipment and facilities, license fees and other external costs. These research and development costs are expensed when incurred.

The Company records upfront and milestone payments made to third parties under licensing arrangements as an expense. Upfront payments are recorded when incurred and milestone payments are recorded when the specific milestone has been achieved.

The Company accounts for government grants as a reduction of research and development expenses. Government grants are recorded at the time the related research and development costs have been incurred by the Company and, accordingly, become eligible for reimbursement. The Company accrues for government grants that have been earned but not yet received.

Nonrefundable advance payments for goods or services to be received in the future for use in research and development activities are deferred and capitalized. The capitalized amounts are expensed as the related goods are delivered or the services are performed.

Stock-based compensation

The Company accounts for its stock-based compensation awards in accordance with ASC Topic 718, *Compensation—Stock Compensation* ("ASC 718"). ASC 718 requires all stock-based payments to employees, including grants of employee stock options, to be recognized in the statements of operations based on their grant date fair values. For stock options granted to employees and to members of the board of directors for their services on the board of directors, the Company estimates the grant date fair value of each option award using the Black-Scholes option-pricing model. The use of the Black-Scholes option-pricing model requires management to make assumptions with respect to the expected term of the option, the expected volatility of the common stock consistent with the expected life of the option, risk-free interest rates and expected dividend yields of the common stock. For awards subject to service-based vesting conditions, the Company recognizes stock-based compensation expense, net of estimated forfeitures, equal to the grant date fair value of stock options on a straight-line basis over the requisite service period.

Clinical trial and pre-clinical study accruals

Prior to the discontinuation of the Company's research and development activities, the Company estimated pre-clinical study and clinical trial expenses pursuant to contracts with research institutions and contract research organizations that conducted and managed pre-clinical studies and clinical trials on the Company's behalf. These estimates were based on the level of service performed and the underlying agreement. Further, the Company accrued expenses related to clinical trials based on the level of patient enrollment and other activities according to the related agreements. The Company monitored patient enrollment levels and other activities to the extent reasonably possible and adjusted estimates accordingly. If actual costs incurred or the timing of services varied from the Company's estimate, the Company adjusted the accrual accordingly. On September 20, 2016 the Company announced its decision to close the ongoing Phase 1 study of MRX34 and halted enrollment and dosing of patients in the study.

Restructuring

Following the closing of the Phase 1 MRX34 clinical trial, the Company implemented a workforce reduction in the fourth quarter of 2016 to reduce operating expenses while it evaluates strategic alternatives. The majority of severance and benefits payments were settled during the first quarter of 2017. The Company entered retention agreements with key employees necessary to close the Phase 1 clinical trial of MRX34 if employees remained with the Company until June 30, 2017 or were terminated by the Company without cause prior to such date. The Company has recognized the restructuring liability for such retention agreements over the employees' service period.

In accordance with ASC 420, *Exit and Disposal Cost Obligations*, the Company has also recognized contract termination costs in connection with a leased property it intended to occupy as its corporate headquarters and research facility, as well as a temporary lab in use prior to the discontinuation of the Company's research and development activities. In addition, the Company has recognized asset impairments related to its lab equipment used in the Phase 1 clinical trial, construction in process, and other property and equipment for which the Company does not expect to receive a future benefit.

Amounts recorded in restructuring charges can result from a complex series of judgments about future events and uncertainties and can heavily rely on estimates and assumptions.

Income taxes

Income taxes are recorded in accordance with ASC 740, *Accounting for Income Taxes* ("ASC 740"), which provides for deferred taxes using an asset and liability approach. The Company recognizes deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements or tax returns. The Company determines its deferred tax assets and liabilities based on differences between financial reporting and tax bases of assets and liabilities, which are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. Valuation allowances are provided if, based upon the weight of available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

The Company accounts for uncertain tax positions in accordance with the provisions of ASC 740. When uncertain tax positions exist, the Company recognizes the tax benefit of tax positions to the extent that the benefit will more likely than not be realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position as well as consideration of the available facts and circumstances. As of December 31, 2016 and 2015, the Company does not have any significant uncertain tax positions.

Comprehensive loss

Comprehensive loss is composed of net loss and other comprehensive income or loss. Other comprehensive loss consists of unrealized gains and losses on marketable securities.

Cash and cash equivalents

The Company considers highly liquid investments with a maturity of three months or less when purchased to be cash equivalents. Cash equivalents, which consist primarily of cash, money market funds and U.S. treasury and agency securities with a maturity of less than 90 days when purchased, are stated at fair value.

Concentrations of credit risk

Financial instruments that potentially subject the Company to credit risk consist primarily of cash and cash equivalents and short-term marketable securities. The Company holds these investments in U.S. treasury and

agency securities and highly-rated corporate debt securities, and limits the amounts of credit exposure to any one financial institution. These amounts at times may exceed federally insured limits. The Company has not experienced any credit losses in such accounts and does not believe it is exposed to any significant credit risk on these funds. The Company has no off-balance sheet concentrations of credit risk, such as foreign currency exchange contracts, option contracts or other hedging arrangements.

At December 31, 2016, available-for-sale securities are invested in U.S. treasury and agency securities and highly-rated corporate debt securities that had a maturity date of three months or greater when acquired. As discussed in Note 3, the fair value of these securities was $44.1 million, or $4,000 less than their original par value purchase price.

Fair value measurements

The Company records money market funds at fair value. ASC Topic 820, *Fair Value Measurements and Disclosures*, establishes a fair value hierarchy for those instruments measured at fair value that distinguishes between assumptions based on market data (observable inputs) and the Company's own assumptions (unobservable inputs). The hierarchy consists of three levels:

- Level 1—Unadjusted quoted prices in active markets for identical assets or liabilities.
- Level 2—Quoted prices for similar assets and liabilities in active markets, quoted prices in markets that are not active, or inputs which are observable, either directly or indirectly, for substantially the full term of the asset or liability.
- Level 3—Unobservable inputs that reflect the Company's own assumptions about the assumptions market participants would use in pricing the asset or liability in which there is little, if any, market activity for the asset or liability at the measurement date.

The carrying amounts reflected in the balance sheets for cash, prepaid expenses and other current assets, accounts payable, and accrued expenses approximate their fair values at December 31, 2016 and 2015, due to their short-term nature.

There have been no changes to the valuation methods during the years ended December 31, 2016 and 2015. The Company evaluates transfers between levels at the end of each reporting period. There were no transfers of assets or liabilities between Level 1, Level 2 or Level 3 during the years ended December 31, 2016 or 2015.

Marketable securities

Marketable securities with maturities at purchase beyond one year, but less than twenty-four months, may be classified as short-term marketable securities based on their highly liquid nature and because such marketable securities represent the investment of cash that is available for current operations. Marketable securities with maturities at purchase beyond twenty-four months are classified as non-current. Available-for-sale securities are maintained by an investment manager and may consist of U.S. Treasury securities and government agency securities and corporate debt securities. Available-for-sale securities are carried at fair value with the unrealized gains and losses included in other comprehensive loss as a component of stockholders' equity until realized. Any premium or discount arising at purchase is amortized and/or accreted to interest income and/or expense over the life of the instrument. Realized gains and losses are determined using the specific identification method and are included in other income.

If any adjustment to fair value reflects a decline in value of the investment, the Company considers all available evidence to evaluate the extent to which the decline is "other-than-temporary" and, if so, mark the investment to market through a charge to the Company's statement of operations and comprehensive loss.

Restricted cash

Restricted cash consists of cash amounts held for specific or limited purposes and, therefore, not available for general operating activities. In June 2016, the Company secured a standby letter of credit of $2.4 million for the benefit of the landlord for the Company's lease of approximately 23,578 square feet of office and laboratory space in the event of default. The restricted cash consists of cash providing security under the terms of the lease described in Note 13.

Property and equipment

Property and equipment consist of laboratory equipment, computer equipment and software, leasehold improvements, furniture and fixtures and office equipment. Property and equipment are stated at cost and depreciated using the straight-line method over the estimated useful lives of the respective assets:

• Laboratory equipment	5-7 years
• Computer equipment and software	3 years
• Leasehold improvements	shorter of asset's useful life or remaining term of lease
• Furniture and fixtures	5 years
• Office equipment	5 years

Costs of major additions and betterments are capitalized; maintenance and repairs, which do not improve or extend the life of the respective assets, are charged to expense as incurred. Upon retirement or sale, the cost of the disposed asset and the related accumulated depreciation are removed from the accounts and the resulting gain or loss is recognized.

Impairment of long-lived assets

The Company periodically evaluates its long-lived assets for potential impairment in accordance with ASC Topic 360, *Property, Plant and Equipment*. Potential impairment is assessed when there is evidence that events or changes in circumstances indicate that the carrying amount of an asset may not be recovered. Recoverability of these assets is assessed based on undiscounted expected future cash flows from the assets, considering a number of factors, including past operating results, budgets and economic projections, market trends and product development cycles. If impairments are identified, assets are written down to their estimated fair value. The Company recognized an impairment charge of $1.4 million for the year ended December 31, 2016.

Offering costs

Deferred offering costs, which consist of direct incremental legal and professional accounting fees relating to preferred stock private placements and initial public offerings, are capitalized. The deferred offering costs are offset against the proceeds from the offering upon the consummation of the offering. In 2014, the Company's initial public offering was delayed and the deferred offering costs for that offering in the amount of $1,920,000 were expensed.

Segment and geographic information

Operating segments are identified as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision maker, or decision making group, in making decisions on how to allocate resources and assess performance. The Company's chief operating decision maker is the chief executive officer. The Company and the chief operating decision maker view the Company's operations and manage its business as one operating segment. The Company operates in only one geographic segment.

Net loss per share attributable to common stockholders

Prior to the IPO, the Company used the two-class method to compute net loss per common share attributable to common stockholders because the Company has issued securities, other than common stock, that contractually entitle the holders to participate in dividends and earnings of the Company. The two-class method requires earnings for the period to be allocated between common stock and participating securities based upon their respective rights to receive distributed and undistributed earnings. Historically, holders of the Company's Series A, Series B, Series B-1, Series C and Series D convertible preferred stock were entitled, on a *pari passu* basis, to receive dividends when, as and if declared by the board of directors, prior and in preference to any declaration or payment of any dividend on the common stock until such time as the total dividends paid on each share of Series C and Series D convertible preferred stock is equal to its cumulative dividends. The Series A, Series B and Series B-1 convertible preferred stock would also be entitled to the dividend amount paid to common stockholders on an as-if-converted-to-common stock basis. As a result, all series of the Company's convertible preferred stock were considered participating securities. All of the Company's outstanding preferred stock was converted to common stock in connection with the IPO in October 2015.

Under the two-class method, for periods with net income, basic net income per common share is computed by dividing the net income attributable to common stockholders by the weighted-average number of shares of common stock outstanding during the period. Net income attributable to common stockholders is computed by subtracting from net income the portion of current year earnings that the participating securities would have been entitled to receive pursuant to their dividend rights had all of the year's earnings been distributed. No such adjustment to earnings is made during periods with a net loss, as the holders of the participating securities have no obligation to fund losses. Diluted net loss per common share is computed by using the weighted-average number of shares of common stock outstanding. Due to net losses for the years ended December 31, 2016, 2015, and 2014, basic and diluted net loss per share attributable to common stockholders were the same, as the effect of all potentially dilutive securities would have been anti-dilutive.

Recent accounting pronouncements

In March 2016, the Financial Accounting Standards Board (FASB) issued ASU 2016-09, *Compensation—Stock Compensation (Topic 718): Improvements to Employee Share Based Payment Accounting* ("ASU 2016-09") as part of the FASB simplification initiative. The new standard provides for changes to accounting for stock compensation including 1) excess tax benefits and tax deficiencies related to share-based payment awards will be recognized as income tax expense in the reporting period in which they occur; 2) excess tax benefits will be classified as an operating activity in the statement of cash flow; 3) the option to elect to estimate forfeitures or account for them when they occur; and 4) increase tax withholding requirements threshold to qualify for equity classification. ASU 2016-09 is effective for public companies for annual periods, and interim periods within those annual periods, beginning after December 15, 2016, and early adoption is permitted. The Company is currently evaluating the impact that ASU 2016-09 will have on the financial statements.

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842)*. The new standard requires the recognition of assets and liabilities arising from lease transactions on the balance sheet and the disclosure of key information about leasing arrangements. Accordingly, a lessee will recognize a lease asset for its right to use the underlying asset and a lease liability for the corresponding lease obligation. Both the asset and liability will initially be measured at the present value of the future minimum lease payments over the lease term. Subsequent measurement, including the presentation of expenses and cash flows, will depend on the classification of the lease as either a finance or an operating lease. Initial costs directly attributable to negotiating and arranging the lease will be included in the asset. For leases with a term of twelve months or less, a lessee can make an accounting policy election by class of underlying asset to not recognize an asset and corresponding liability. Lessees will also be required to provide additional qualitative and quantitative disclosures regarding the amount, timing and uncertainty of cash flows arising from leases. These disclosures are intended to supplement the amounts recorded in the financial statements and provide additional information about the nature of an organization's leasing activities. The new standard is effective for fiscal years beginning after December 15,

2018, and interim periods within those years, with early adoption permitted. In transition, lessees are required to recognize and measure leases at the beginning of the earliest period presented using a modified retrospective approach. The transition guidance also provides specific guidance for sale and leaseback transactions, build-to-suit leases and amounts previously recognized in accordance with the business combinations guidance for leases. The Company is currently evaluating our expected adoption method and the impact of this new standard on the financial statements.

In August 2014, the FASB issued ASU 2014-15, *Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern*. The ASU is intended to define management's responsibility to evaluate whether there is substantial doubt about an organization's ability to continue as a going concern and to provide related footnote disclosures. For all entities, the ASU is effective for annual periods ending after December 15, 2016 and interim periods within annual periods beginning after December 15, 2016. The Company adopted this standard in 2016.

3. Marketable Securities

The following table summarizes the available-for-sale securities held at December 31, 2016 (in thousands):

December 31, 2016	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
U.S. government agency securities and treasuries	$ 42,516	$ 4	$ (8)	$ 42,512
Corporate debt securities	1,554	—	—	1,554
Total available-for-sale securities	$ 44,070	$ 4	$ (8)	$ 44,066

The Company did not have available for sale securities at December 31, 2015. There were no available for sale securities held as of December 31, 2016 with maturities greater than one year.

4. Fair Value Measurements

The following sets forth the Company's assets that are measured at fair value on a recurring basis as of December 31, 2016 and December 31, 2015:

	Total	Quoted prices in active markets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
December 31, 2016				
Assets:				
Cash and Cash Equivalents				
Cash	$ 2,785	$ 2,785	—	—
Money market funds	9,647	$ 9,647	—	—
US government agency securities and treasuries	4,000	—	4,001	
Total cash and cash equivalents	16,432	12,432	4,001	—
Marketable securities				
U.S. government agency securities and treasuries	42,512	—	42,512	—
Corporate debt securities	1,554	—	1,554	—
Total marketable securities	44,066	—	44,066	—
Restricted cash	2,432	2,432	—	—
Total assets	$62,930	$14,864	$ 48,067	$ —
December 31, 2015				
Assets:				
Money Market Funds	89,713	89,713	—	—
Total Assets	$89,713	$89,713	$ —	$ —

Cash and cash equivalents

The Company considers all highly liquid securities with original final maturities of three months or less from the date of purchase to be cash equivalents. As of December 31, 2016 and December 31, 2015, cash and cash equivalents are comprised of cash, money market accounts, U.S. government agency securities and corporate debt securities.

Marketable securities.

The cost of available-for-sale securities is adjusted for amortization of premiums and accretion of discounts to maturity. At December 31, 2016, the balance in the Company's accumulated other comprehensive loss was composed solely of activity related to the Company's available-for-sale marketable securities. The Company has not realized material gains or losses on sales of available-for-sale investment securities during any of the periods presented.

As of December 31, 2016, available for sale securities of approximately $15.4 million were in an unrealized loss position of $7,700. The Company has the intent and ability to hold such securities until recovery. The Company determined that there were no material changes in the credit risk of the above investments. The Company did not hold any investments with an other-than-temporary impairment as of December 31, 2016 and December 31, 2015.

5. Property and Equipment

Property and equipment consisted of the following (in thousands):

	December 31, 2016	December 31, 2015
Machinery, computers and equipment	$ 385	$ 687
Leasehold improvements	—	18
Accumulated depreciation	(31)	(330)
	$ 354	$ 375

Depreciation expense was $159,000, $54,000 and $35,000 in 2016, 2015 and 2014, respectively.

Following the discontinuation of research and development activities and corresponding workforce reduction, the Company determined that certain property and equipment was impaired and recognized an impairment charge of $1.4 million in restructuring charges in the statement of operations for the year ended December 31, 2016 (see Note 9).

6. Accrued expenses

Accrued expenses consist of the following (in thousands):

	December 31,	
	2016	2015
Accrued restructuring	$1,609	$ —
Professional fees	259	437
Clinical trial costs	220	489
Compensation and related items	154	1,151
Other	158	137
	$2,400	$2,214

Included in accrued restructuring are severance and benefits of approximately $1,097,000 and the current portion of contract termination costs related to a leased facility of $512,000. See Note 9 for additional discussion.

7. Shareholders' Equity

Common Stock

The voting, dividend and liquidation rights of holders of shares of common stock are subject to and qualified by the rights, powers and preferences of the holders of shares of convertible preferred stock. The Company's common stock has the following characteristics:

The holders of shares of common stock are entitled to one vote for each share of common stock held at all meetings of stockholders and written actions in lieu of meetings.

The holders of shares of common stock are entitled to receive dividends, if and when declared by the Company's board of directors. Cash dividends may not be declared or paid to holders of common stock until paid on each series of outstanding convertible preferred stock in accordance with their respective terms. As of December 31, 2016, no cash dividends have been declared or paid since the Company's inception.

Reverse Stock Split

In September 2015, the stockholders approved a reverse stock split of the outstanding shares of the Company's common stock, Series A convertible preferred stock, Series B convertible preferred stock, Series B-1 convertible preferred stock, Series C convertible preferred stock and Series D convertible preferred stock in which every 15 shares were converted into one share of the related stock. No fractional shares were issued as a result of the reverse stock split. The par value for each class of stock remained at $0.001 per share. The effect of the reverse stock split has been recognized retroactively, in all share and price per share data presented in the financial statements and the notes to the financial statements.

Offerings

In September 2015, the Company entered into a new grant contract with Cancer Prevention and Research Institute of Texas ("CPRIT") in connection with an award of approximately $16.8 million. The 2015 award was in the form of an agreement by CPRIT to purchase $16.8 million of shares of common stock of the Company in a private placement concurrent with the initial public offering of the Company's common stock. On October 5, 2015, CPRIT purchased 2,395,010 shares of the Company's common stock at $7.00 per share. Net proceeds from the private placement, after related transaction offering costs, were approximately $16.6 million.

In October 2015, the Company issued 6.25 million shares of common stock in an underwritten public offering, with a price of $7.00 per share. The underwriters purchased an additional 704,962 shares of common stock pursuant to their options to purchase additional shares. The Company received aggregate net proceeds of approximately $43.7 million in the public offering, after deducting the underwriting discounts and commissions and estimated offering expenses payable by the Company.

8. Stock Option Plans

2008 Long Term Incentive Plan

During 2008, the Company adopted the 2008 Long Term Incentive Plan, which allows for incentive stock options for its employees and nonqualified stock options (inclusive of restricted stock units and stock appreciation rights) (the "2008 Plan") for employees and nonemployees under which an aggregate of 330,582 stock options and stock purchase rights may be granted. In December 2013, the total amount available for grant under the 2008 Plan was increased by 224,200 to 554,782. In March 2014, the Company's board of directors approved an increase of 115,153 shares available for grant pursuant to the 2008 Plan to 669,935. In March 2015, the total amount of available to grant under the 2008 Plan was increased in conjunction with the Company's offering of Series D preferred stock by 391,650 shares to 1,061,585. Options under the 2008 Plan have a maximum life of 10 years. Options vest at various intervals, as determined by the Company's board of directors at the date of grant.

2015 Equity Incentive Plan

In August 2015, the Company's board of directors approved the 2015 Equity Incentive Award Plan, (the "2015 Plan"), which was effective in connection with the pricing of the IPO on September 30, 2015. The 2015 Plan provides for the granting of a variety of stock-based compensation awards, including stock options, stock appreciation rights, or SARs, restricted stock awards, restricted stock unit awards, deferred stock awards, dividend equivalent awards, stock payment awards, performance awards and other stock-based awards. The 2015 Plan is the successor to the 2008 Plan and the 706,656 options outstanding in the 2008 Plan at December 31, 2016 may be transferred to the 2015 Plan if awards thereunder terminate, expire or lapse for any reason without the delivery of shares to the holder thereof. As of December 31, 2016, 88,510 shares have been transferred from the 2008 Long Term Incentive Plan to the 2015 Equity Incentive Plan for awards that have terminated, expired or lapsed. Under the 2015 Plan, 1,671,800 shares of the Company's common stock were initially authorized and reserved for issuance. In addition, 1,041,527 shares of the Company's common stock were authorized and reserved for issuance in the first quarter of 2016, for a total of 2,801,836 authorized for grant under the 2015 Plan at December 31, 2016.

2015 Employee Stock Purchase Plan

In August 2015, the Company's board of directors approved the 2015 Employee Stock Purchase Plan (the "ESPP"), which was effective in connection with the pricing of the IPO on September 30, 2015. The ESPP allows eligible employees to purchase shares of the Company's common stock at a discount through payroll deductions of up to 15% of their eligible compensation, subject to any plan limitations. The ESPP generally provides for set offering periods, and at the end of each offering period, employees are able to purchase shares at 85% of the lower of the fair market value of the Company's common stock on the first trading day of the offering period or on the last trading day of the offering period. Employees exercised their option to purchase 5,525 shares of common stock under the ESPP as of December 31, 2016. Shares available for future purchase under the ESPP were 369,960 at December 31, 2016; however, the Company has suspended future issuances of Mirna Therapeutics, Inc. common stock under the ESPP plan.

Stock Option Activity

The Company's stock option activity for the years ended December 31, 2016, 2015, and 2014 was as follows:

	Number of Shares	Weighted-Average Exercise Price	Weighted-Average Contractual Life (years)
Outstanding at December 31, 2013	354,833	$ 2.40	8.80
Granted	234,447	8.10	
Exercised	(80,816)	2.40	
Forfeited/canceled	(7,553)	4.70	
Outstanding at December 31, 2014	500,911	4.95	8.85
Granted	1,057,082	6.82	
Exercised	(28,516)	2.36	
Forfeited/canceled	(18)	7.50	
Outstanding at December 31, 2015	1,529,459	6.28	9.00
Granted	928,250	4.41	
Exercised	(5,313)	1.65	
Forfeited/canceled	(547,182)	6.26	
Outstanding at December 31, 2016	1,905,214	$ 5.39	7.49
Options Exercisable at December 31, 2016	838,922	$ 5.45	5.57

The total intrinsic value of options exercised during the years ended December 31, 2016, 2015 and 2014 was $13,000, $160,000, and $383,000, respectively. The intrinsic value of options exercisable and total options outstanding at December 31, 2016 was $28,000 and $28,000, respectively. The total fair value of options vested during the years ended December 31, 2016, 2015 and 2014 was $1,524,000, $858,000 and $198,000, respectively.

Stock Based Compensation Expense

Total stock-based compensation expense was allocated as follows (in thousands):

	Year Ended December 31,		
	2016	2015	2014
Research and development expense	$ 372	$306	$110
General and administrative expense	1,220	679	298
	$1,592	$985	$408

There was approximately $3.5 million of unrecognized compensation cost related to the stock options granted under the 2015 Plan, which is expected to be amortized over the next 2.6 years. There were no restricted stock units or stock appreciation rights granted under the 2015 Plans of December 31, 2016.

The fair value of each stock option award is estimated on the date of grant using the Black-Scholes option-pricing model that uses the assumptions noted in the table below. Expected volatility for the Company's common stock was determined based on an average of the historical volatility of a peer group of similar companies. The Company has limited stock option exercise information. Accordingly, the expected term of stock options granted was calculated using the simplified method, which represents the average of the contractual term of the stock option and the weighted-average vesting period of the stock option. The assumed dividend yield is based upon the Company's expectation of not paying dividends in the foreseeable future. The risk-free rate for periods within the expected life of the stock option is based upon the U.S. Treasury yield curve in effect at the time of grant.

The assumptions used in the Black-Scholes option-pricing model for stock option grants during the years ended December 31, 2016, 2015 and 2014 are as follows:

	Year Ended December 31,		
	2016	2015	2014
Expected life (in years)	5.5 - 6.1	5.9 - 6.7	5.8 - 6.1
Risk-free interest rate	1.1% - 1.6%	1.6% - 2.0%	1.8% - 2.8%
Expected volatility	76.9% - 79.5%	77.5% - 84.7%	75.3% - 85.4%
Expected dividend yield	—	—	—
Weighted-average grant date fair value per share	$2.97	$4.73	$5.40

No related tax benefits were recognized for the years ended December 31, 2016, 2015 or 2014.

9. Restructuring Charges

On September 20, 2016, Mirna announced its decision to close the ongoing Phase 1 study of MRX34 and voluntarily halted the enrollment and dosing of patients in the study. Following the announcement, the Company received verbal notice from the U.S. Food and Drug Administration ("FDA") on September 28, 2016 that its Investigational New Drug MRX34 had been placed on full clinical hold. Following the Company's announcement and notification from the FDA, Mirna's Board of Directors approved a reduction of the total number of full-time employees from 36 to 12. The Company also committed to retention payments to certain key

employees if such employees remained with the Company until June 30, 2017 or were terminated by Mirna without cause prior to such date. Restructuring charges are expected to be incurred through June 30, 2017 and total approximately $4.7 million, including non-cash impairment charges of $1.4 million.

Restructuring charges were as follows (in thousands):

	Year ended December 31, 2016
Employee severance and related costs	$ 1,554
Contract termination costs	1,486
Asset impairment costs	1,402
Total restructuring charges	$ 4,442

There were no restructuring charges for the year ended December 31, 2015.

The accrued restructuring activity during the year ended December 31, 2016 was as follows (in thousands):

	Employee severance and related costs	Contract Termination Costs	Total
Balance at December 31, 2015	—	—	—
Restructuring Charge	$ 1,554	$ 1,486	$3,040
Cash payments	(457)	—	(457)
Other (1)	—	79	79
Balance at December 31, 2016	$ 1,097	$ 1,565	$2,662

(1) Other includes the effect of historical deferred rent and prepaid balances recognized under the leases terminated under contract termination costs.

Employee severance and related costs

Of the total accrued restructuring balance of $2.7 million, approximately $1.6 million has been presented as a current liability and $1.1 million has been presented as a long-term liability. Employee severance and benefits costs recorded in restructuring charges for the year ended December 31, 2016 included $1.5 million in employee severance and benefits costs and $0.1 million for accrued retention payments which are being recognized over the respective employee's service period.

Contract termination costs

Contract termination costs recorded in restructuring charges for the year ended December 31, 2016 of $1.5 million related to the Company's determination to cease use and not occupy the Company's headquarters and research facility in connection with the lease the Company entered into in June 2016 (see Note 14). In connection with this determination, the Company recorded a liability of $1.6 million, which is equal to the fair value of the lease obligation at the cease-use date of November 20, 2016, after adjusting for the effects of prepaid and deferred rent balances related to the lease, of which $1.1 million has been recorded as a long term liability in the balance sheets within Lease obligations. The Company estimated the liability for the contract termination costs associated with the lease as of the cease-use date based on the discounted present value of the remaining lease payments, considering future estimated sublease income, estimated broker fees and contractual executory costs.

Asset impairment costs

Following the discontinuation of research and development activities and corresponding workforce reduction, the Company determined that certain property and equipment was impaired and recognized an

impairment charge of $1.4 million in restructuring expense in the statement of operations for the year ended December 31, 2016. Of the total impairment charge, approximately $555,000 relates to the impairment of lab equipment which had a salvage value of $320,000 based on a third party appraisal of the lab equipment, which was sold for $325,000 in February 2017 (see Note 17). In addition, the Company recognized an impairment of $591,000 in construction in progress for the Company's planned headquarters and research facility associated with the termination of the lease contract discussed above. Further, following the workforce reduction, the Company sold or donated its remaining office equipment with the exception of nominal office equipment necessary to continue administrative functions and the closure of its Phase 1 clinical trial, resulting in an impairment of furniture, computers and equipment and leasehold improvements of $256,000.

10. Income Taxes

The Company recorded no provision for income taxes as of December 31, 2016 due to reported net losses since inception.

A reconciliation of the expected income tax benefit (expense) computed using the federal statutory income tax rate to the Company's effective income tax rate is as follows for the years ended December 31, 2016, 2015 and 2014 (in thousands):

	2016	2015	2014
Income tax benefit computed at federal statutory tax rate	$(8,931)	$(8,494)	$(5,383)
Change in valuation allowance	9,287	9,002	5,675
General business credits	(572)	(661)	(386)
Other	216	153	94
Total	$ —	$ —	$ —

The Company has established a valuation allowance due to uncertainties regarding the realization of deferred tax assets based upon the Company's lack of earnings history. During the year ended December 31, 2016, the valuation allowance increased by $9.3 million. Significant components of the Company's deferred tax assets and liabilities as of December 31, 2016 and 2015 are as follows (in thousands):

	2016	2015
Net operating loss carryforwards	$ 27,518	$ 19,562
Depreciation and amortization	1,367	1,207
Stock-based compensation	597	260
Credit carryforwards	1,717	1,147
Prepaid expenses	—	—
Accrued liabilities	538	264
Total deferred tax assets	31,737	22,440
Valuation allowance	(31,737)	(22,440)
Net deferred tax asset	$ —	$ —

As of December 31, 2016 and 2015, the Company had net operating loss ("NOL") carryforwards for federal income tax purposes of approximately $80.9 million and $57.5 million, respectively. As of December 31, 2016 and 2015, the Company also had available research and development tax credits for federal income tax purposes of approximately $1,441,000 and $985,000, respectively. If not utilized, these carryforwards expire at various dates beginning in 2028. As of December 31, 2016, the Company had state research and development tax credit carryforwards of approximately $267,000, which will begin to expire in 2024 if not utilized.

Utilization of the NOL carryforwards and tax credit carryforwards may be subject to a substantial annual limitation due to ownership change limitations that have occurred previously or that could occur in the future, as

provided by Section 382 of the Internal Revenue Code of 1986 ("Section 382"), as well as similar state provisions. Ownership changes may limit the amount of NOL carryforwards and tax credit carryforwards that can be utilized annually to offset future taxable income and tax, respectively. In general, an ownership change, as defined by Section 382, results from transactions that increase the ownership of 5% shareholders in the stock of a corporation by more than 50 percentage points in the aggregate over a three-year period. The Company has not performed a study to determine whether any ownership change has occurred since the Company's formation through December 31, 2016. However, the Company believes that it has experienced at least one ownership change in the past and that it may experience additional ownership changes as a result of subsequent shifts in its stock ownership. Should there be an ownership change that has occurred or will occur, the Company's ability to utilize existing carryforwards could be substantially restricted.

The Company applies the accounting guidance in ASC 740 related to accounting for uncertainty in income taxes. The Company's reserves related to taxes are based on a determination of whether, and how much of, a tax benefit taken by the Company in its tax filings or positions is more likely than not to be realized following resolution of any potential contingencies present related to the tax benefit. As of December 31, 2016 and 2015, the Company had no unrecognized tax benefits. During the years ended December 31, 2016 and 2015, the Company had no interest and penalties related to income taxes.

The Company files income tax returns in the U.S. federal and Texas jurisdictions. As of December 31, 2016, the statute of limitations for assessment by the Internal Revenue Service ("IRS") is open for the 2013 and subsequent tax years, although carryforward attributes that were generated for tax years prior to then may still be adjusted upon examination by the IRS if they either have been, or will be, used in a future period. The 2012 and subsequent tax years remain open and subject to examination by the State of Texas. There are currently no federal or state income tax audits in progress.

11. Shared Services Agreement with Asuragen

On November 3, 2009, the Company entered into an agreement with Asuragen under which Asuragen shares space with and provides services to the Company in support of the Company's business. Such services have included human resources, finance and accounting, information technology, purchasing, shipping and receiving, equipment use, and various facility expenses. The Company pays Asuragen a monthly service fee for the services provided by Asuragen to the Company, which does not include direct charges incurred by Asuragen on behalf of the Company. The Company paid Asuragen approximately $316,000, $490,000 and $506,000 for the years ended December 31, 2016, 2015 and 2014, respectively.

On October 31, 2014, the Company entered into a sublease agreement with Asuragen for use of office, laboratory and shared space. Total rent expense was approximately $59,000 and $89,000 for the year ended December 31, 2016 and 2015, respectively. Both the lease and the shared service agreements expired on August 31, 2016.

12. Retirement Plan

The Company sponsors a defined contribution plan that provides all eligible employees an opportunity to accumulate funds for retirement. Employees who have completed 90 days of service and are at least 21 years of age may contribute to this plan, and these contributions are matched by the employer on a basis that is determined annually by the Company's board of directors. The Company may also make profit sharing contributions to the plan. Employer contributions for 2016, 2015 and 2014 were approximately $169,000, $117,000 and $91,000, respectively.

13. License Agreements

Rosetta Genomics Ltd.

In December 2015, the Company entered into a Patent License Agreement (the "License Agreement") with Rosetta Genomics Ltd. ("Rosetta"), licensing to the Company certain patents owned or controlled by Rosetta as specified in the License Agreement. Under the License Agreement, Rosetta has granted the Company a non-assignable, non- transferable, worldwide license for certain patents in connection with the development and commercialization of products that relate to the tumor suppressor microRNA MIR-34 ("Products"). This license is exclusive with respect to Products that relate to MRX34, the Company's first product candidate which has been placed on full clinical hold by the Food & Drug Administration ("FDA") and non-exclusive for products that are not related to MRX34.

Under the License Agreement, the Company paid Rosetta an up-front, non- refundable payment of $1.6 million in January 2016, which was accrued as an expense within research and development for the year ended December 31, 2015. The Company shall also be obligated to pay low single- digit royalties on net sales of Products, as well as royalties on sublicense revenues. Certain development and regulatory milestone payments totaling $3 million may also be payable in connection with specified types of Products, upon the achievement of certain development and/ or regulatory milestone events.

Marina Biotech, Inc.

In December 2011, the Company entered into a licensing agreement with Marina, pursuant to which Marina granted to the Company a license to liposomal delivery technology, NOV340, known under the brand name "SMARTICLES," to develop and commercialize drug products incorporating Marina's delivery system exclusively in combination with the Company's first therapeutic product, MRX34, which has been placed on full clinical hold by the FDA. In December 2013, the license agreement was amended to include three additional specific mimics selected by the Company to use with SMARTICLES on an exclusive basis, and in May 2015, the license agreement was further amended to reduce the amount of a specific milestone payment and to provide for the prepayment of such milestone payment. In August 2015, the Company also entered into a side letter to the license agreement, under which it exercised its right to select an additional specific microRNA, in exchange for the payment of a specified selection fee payment.

The Company has cumulatively paid Marina approximately $2.1 million through December 31, 2016 in up-front and milestone payments and as consideration for the inclusion within the license of four additional microRNA compounds. Although the Company has discontinued its research and development activities, the Company would be required to make payments to Marina based upon the achievement of certain development and regulatory milestones, totaling up to $6 million in the aggregate for each licensed product. The Company has agreed to pay up to an additional $4 million per licensed product upon the achievement of certain regulatory milestones for a specified number of additional indications, leading to a maximum cap on all milestone payments of $10 million per product. The exception to this is for the Company's first therapeutic product, MRX34, where the aggregate of all remaining development and regulatory milestone payments due to Marina, including for all additional indications, is $4.0 million.

In addition to milestone payments, the Company will be required to pay low single digit royalties on net sales of licensed products other than MRX34, subject to customary reductions and offsets. As a result of the Company's 2013 amendment to the agreement with Marina, the Company is no longer required to pay a royalty to Marina with respect to sales of the Company's first therapeutic product, MRX34. If the Company sublicenses its rights under the license from Marina, for each optioned microRNA compound covered by such sublicense the Company is required to pay a specified lump-sum payment representing the remainder of the selection fee for the inclusion of such microRNA compound within the scope of the license agreement, as well as a portion of any revenue the Company receives from such sublicensees at a tiered percentage between the very low single digits and the mid-teens, depending on the circumstances in which the sublicense is entered into.

Yale University

In 2006, Asuragen entered into an exclusive license agreement with Yale University ("Yale") under certain patent rights relating to microRNAs arising from the laboratory of Dr. Frank Slack. This agreement was assigned to the Company by Asuragen in connection with the Company's acquisition of certain assets, including patent rights, in 2009. In February 2014, the Company as successor-in-interest to Asuragen, amended and restated the exclusive license agreement. Some of the patent filings in the Company's intellectual property portfolio that are licensed to the Company by Asuragen are also included in the patents licensed under the agreement with Yale. The Company will be required to pay royalties to Yale on net sales of licensed products that contain specified microRNAs, at a percentage ranging from the very low to the low single digits, subject to customary reductions and offsets. The Company will also be required to pay to Yale a portion of specified gross revenue that the Company receives from the Company's sublicensees at a percentage in the mid-single digits.

The Company will be required to make payments for achievement of certain development and regulatory milestones by products containing one specified microRNA and covered by the licensed patents, of up to $600,000 in the aggregate for each such product, subject to reduction in certain circumstances. In addition, the Company is required to pay an annual license maintenance fee and minimum annual royalties under certain circumstances.

The Company provided Yale University with notice of termination effective March 2017, following the discontinuation of its research and development activities.

14. Commitments and Contingencies

Operating Lease

In June 2016, the Company entered into a lease for its corporate headquarters and research facility in Austin, Texas (the "Headquarters") under an operating lease agreement (the "Lease"). The Lease commenced on January 1, 2017 (the "Commencement Date"). The initial term of the lease is for a 123 month period, with the option to extend the lease for up to two consecutive 60 month terms. Rent expense under the Lease for year ended December 31, 2016 through the cease-use date discussed in Note 9 was approximately $165,000.

The Lease provides annual base rent of approximately $600,000 in the first year after a three-month rent-free period following the Commencement Date, with subsequent annual increases of approximately 3% in the annual base rent. In connection with the Lease, the landlord has provided a tenant improvement allowance of approximately $1.9 million to be used by the Company to build-out certain improvements to the Headquarters. The Lease also provides for an additional improvement allowance of up to $1.3 million. The additional allowance, if exercised, will amortize over 120 months on a straight-line basis. There have been no draws on the additional improvement allowance as of December 31, 2016.

Mirna has obtained a standby letter of credit for the initial amount of approximately $2.4 million (the "Letter of Credit"), which may be drawn down by the landlord in the event of default. If Mirna meets certain requirements, the amount due under the Letter of Credit may be reduced to approximately $800,000.

In November 2016, following the workforce reduction described in Note 8, the Company determined to cease use and not occupy the headquarters and research facility under the Lease. See Note 9 to the financial statements for further information on the accounting for the Lease.

Under the Lease, future minimum payments payable are approximately as follows:

Period ending December 31,	Operating Lease
2017	$ 450,929
2018	614,855
2019	633,364
2020	652,340
2021 and thereafter	4,565,888
Total	$ 6,917,376

CPRIT

In August 2010, the Company entered into a grant contract with the Cancer Prevention and Research Institute of Texas (CPRIT), under which it received a $10.3 million commercialization award from the State of Texas through CPRIT. CPRIT was established to expedite innovation and commercialization in the area of cancer research and to enhance access to evidence-based prevention programs and services throughout the State of Texas. The award was a three-year award that was funded annually, and the contract terminated on January 31, 2014, subject to the Company's obligations to make certain payments that survive termination. Under the terms of the award, the Company will be required to pay to CPRIT a portion of the Company's revenues from sales of certain products by the Company, or received from our licensees or sublicensees, at a percentage in the low single digits until the aggregate amount of such payments equals a specified multiple of the grant amount, and thereafter at a rate of less than one percent, subject to the Company's right, under certain circumstances, to make a one-time payment in a specified amount to CPRIT to buy out such payment obligations. The 2010 grant contract also contains a provision that provides for repayment to CPRIT some amount not to exceed the full amount of the grant proceeds under certain specified circumstances involving relocation of our principal place of business outside Texas.

Legal Contingencies

The Company does not currently have any contingencies related to ongoing legal matters.

15. Net Loss Per Share Attributable to Common Stockholders

The following table summarizes the computation of basic and diluted net loss per share attributable to common stockholders of the Company (in thousands, except share and per share data):

	Year Ended December 31,		
	2016	2015	2014
Net loss	$ (26,268)	$ (24,983)	$(15,834)
Accretion of convertible preferred stock to redemption value	—	(449)	—
Accrued dividends on convertible preferred stock	—	(3,871)	(2,824)
Net loss attributable to common stockholders—basic and diluted	(26,268)	(29,303)	(18,658)
Weighted-average number of common shares—basic and diluted	20,833,963	5,010,323	64,131
Net loss per share attributable to common stockholders—basic and diluted	$ (1.26)	$ (5.85)	$(291.00)

The following potentially dilutive securities outstanding, prior to the use of the treasury stock method or if-converted method, have been excluded from the computation of diluted weighted-average common shares outstanding, because including them would have had an anti-dilutive effect due to the losses reported.

	December 31,		
	2016	2015	2014
Convertible preferred stock	—	7,921,490	5,599,939
Stock options	1,905,214	1,529,459	500,911
	1,905,214	9,450,949	6,100,850

16. Selected Quarterly Data (unaudited)

The following table contains quarterly financial information for 2016 and 2015. The operating results for any quarter are not necessary indicative of results for any future period.

	2016 Quarter Ended			
	December 31	September 30	June 30	March 31
Operating Expenses:				
Research and development	$ 2,341	$ 3,384	$ 3,682	$ 4,523
General and administrative	1,999	1,940	2,049	2,130
Restructuring charges	4,442	—	—	—
Loss on disposal of assets	—	128		
Total operating expenses	8,782	5,452	5,731	6,653
Other (income)	(88)	(87)	(93)	(82)
Net loss	(8,694)	(5,365)	(5,638)	(6,571)
Net loss per share attributable to common stockholders—basic and diluted	(0.42)	(0.26)	(0.27)	(0.32)

	2015 Quarter Ended			
	December 31	September 30	June 30	March 31
Operating Expenses:				
Research and Development	$ 6,363	$ 4,683	$ 4,499	$ 3,402
General and Administrative	2,462	1,556	1,185	877
Total operating expenses	8,825	6,239	5,684	4,279
Other (income)	(36)	(8)	—	—
Net loss	(8,789)	(6,231)	(5,684)	(4,279)
Net loss attributable to common stockholders	(8,890)	(7,785)	(7,229)	(5,397)
Net loss per share attributable to common stockholders—basic and diluted	(0.45)	(82.16)	(78.87)	(60.99)

17. Subsequent Events

Sale of Lab Equipment

In February 2017, the Company entered into an Asset Purchase Agreement for the sale of the Company's Lab Equipment with a third party for cash consideration of $325,000. The selling price of the Lab Equipment approximated its book value at December 31, 2016.

MIRNA THERAPEUTICS, INC.

Condensed Balance Sheets
(in thousands, except share and per share data)

	March 31, 2017 (unaudited)	December 31, 2016
Assets		
Current Assets:		
Cash and cash equivalents	$ 17,121	$ 16,432
Short-term marketable securities	40,408	44,066
Prepaid expenses and other current assets	620	882
Total current assets	58,149	61,380
Property and equipment, net	26	354
Restricted cash	2,433	2,432
Total assets	$ 60,608	$ 64,166
Liabilities and Stockholders' Equity (Deficit)		
Current Liabilities:		
Accounts payable	$ 371	$ 361
Accrued expenses	4,486	2,400
Total current liabilities	4,857	2,761
Lease obligations, long-term	—	1,053
Total liabilities	4,857	3,814
Stockholders' Equity (Deficit):		
Preferred stock, $0.001 par value, 5,000,000 shares authorized at March 31, 2017 and December 31, 2016; 0 shares outstanding at March 31, 2017 and December 31, 2016	—	—
Common stock, $0.001 par value; 250,000,000 shares authorized at March 31, 2017 and December 31, 2016; 20,856,693 and 20,841,393 shares issued and outstanding at March 31, 2017 and December 31, 2016, respectively	21	21
Additional paid in capital	163,518	163,126
Accumulated deficit	(107,771)	(102,791)
Other comprehensive loss	(17)	(4)
Total stockholders' equity	55,751	60,352
Total liabilities and stockholders' equity	$ 60,608	$ 64,166

The accompanying notes are an integral part of these condensed financial statements.

MIRNA THERAPEUTICS, INC.

Condensed Statements of Operations and Comprehensive Loss (Unaudited)
(in thousands, except share and per share data)

	Three Months Ended March 31,	
	2017	2016
Operating expenses:		
Research and development	$ 242	$ 4,523
General and administrative	2,264	2,130
Restructuring charges	2,557	—
Total operating expenses	5,063	6,653
Other income:		
Interest income	86	82
Net loss attributable to common stockholders	$ (4,977)	$ (6,571)
Other comprehensive loss:		
Unrealized gain/ (loss) on available for sale securities, net of tax	(13)	9
Total other comprehensive loss	(4,990)	(6,562)
Net loss per share attributable to common stockholders—basic and diluted	$ (0.24)	$ (0.32)
Common shares used to compute basic and diluted net loss per share attributable to common stockholders	20,850,494	20,830,555

The accompanying notes are an integral part of these condensed financial statements.

MIRNA THERAPEUTICS, INC.

Condensed Statements of Cash Flows (Unaudited)
(in thousands)

	Three Months Ended March 31,	
	2017	2016
Operating activities		
Net loss	$ (4,977)	$ (6,571)
Adjustment to reconcile net loss to net cash used in operating activities:		
Restructuring charges	2,557	—
Depreciation and amortization	5	19
Stock-based compensation	364	447
Net amortization of premium/ discounts on marketable securities	87	19
Changes in operating assets and liabilities:		
Prepaid expenses and other assets	262	(192)
Accounts payable	10	(2,448)
Accrued expenses	(1,524)	(247)
Net cash used in operating activities	(3,216)	(8,973)
Investing activities		
Purchases of marketable securities	(12,019)	(27,722)
Maturities of marketable securities	15,577	—
Proceeds from the sale of equipment	325	—
Purchases of property and equipment	(3)	(143)
Net cash provided by/ (used in) investing activities	3,880	(27,865)
Financing activities		
Proceeds from the exercise of stock options	25	—
Cash provided by financing activities	25	—
Net increase (decrease) in cash and cash equivalents	689	(36,838)
Cash and cash equivalents at beginning of period	16,432	89,713
Cash and cash equivalents at end of period	$ 17,121	$ 52,875

The accompanying notes are an integral part of these condensed financial statements.

MIRNA THERAPEUTICS, INC.

Notes to Condensed Financial Statements (Unaudited)

1. Nature of Business and Basis of Presentation

Nature of business

Mirna Therapeutics, Inc. ("Mirna" or "the Company") is a biopharmaceutical company that has historically focused on microRNA-based oncology therapeutics. The Company was incorporated in Delaware in December 2007 as a wholly-owned subsidiary of Asuragen, Inc. ("Asuragen") and was spun out to existing Asuragen stockholders in December 2009. Following the close of the Company's Phase 1 clinical trial of MRX34 in September 2016, the Company began to evaluate its strategic alternatives focusing on enhancing stockholder value, including the possibility of a merger or sale of the Company. Mirna has discontinued further research and development activities (see Note 9) to reduce operating expenses while it evaluates these opportunities and closed its Investigational New Drug Application for MRX34. The Company is located in Austin, Texas.

The Company continues to be subject to a number of risks common to companies in similar stages of development. Principal among these risks are uncertainties of technological innovations, dependence on key individuals, development of the same or similar technological innovations by the Company's competitors and protection of proprietary technology. The Company believes that its cash, cash equivalents and marketable securities of $57.5 million at March 31, 2017 will enable the Company to maintain its current and planned operations for at least the next twelve months.

Basis of presentation

The accompanying interim condensed financial statements as of March 31, 2017 and for the three months ended March 31, 2017 and 2016, and the related interim information contained within the notes to the financial statements, are unaudited. The unaudited interim condensed financial statements have been prepared in accordance with generally accepted accounting principles for interim financial information and on the same basis as the audited financial statements. In the opinion of management, the accompanying unaudited interim condensed financial statements contain all adjustments which include only normal recurring adjustments necessary to state fairly the Company's financial position as of March 31, 2017, and the results of its operations and cash flows for the interim periods ended March 31, 2017 and 2016. Such adjustments are of a normal and recurring nature. The interim financial data as of March 31, 2017 is not necessarily indicative of the results to be expected for the year ending December 31, 2017, or for any future period.

The accompanying condensed financial statements and related financial information should be read in conjunction with the audited financial statements and related notes thereto for the year ended December 31, 2016 included in the Company's Form 10-K, most recently filed with the Securities and Exchange Commission on March 15, 2017.

2. Summary of Significant Accounting Policies

Use of estimates

The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires the Company's management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Amounts included in the financial statements, such those recorded in restructuring charges, can result from a complex series of judgments about future events and uncertainties and can heavily rely on estimates and assumptions. Actual results could differ from those estimates.

Research and development costs

Research and development costs are expensed as incurred. Research and development costs include salaries and personnel-related costs, consulting fees, fees paid for contract research services, the costs of laboratory

equipment and facilities, development of intellectual property, license fees and other external costs. The Company accounts for government grants as a reduction of research and development expenses. Government grants are recorded at the time the related research and development costs have been incurred by the Company and, accordingly, become eligible for reimbursement. The Company accrues for government grants that have been earned but not yet received.

Nonrefundable advance payments for goods or services to be received in the future for use in research and development activities are deferred and capitalized. The capitalized amounts are expensed as the related goods are delivered or the services are performed.

Clinical Trial and Pre-Clinical Study Accruals

Prior to the discontinuation of the Company's research and development activities, the Company estimated pre-clinical study and clinical trial expenses pursuant to contracts with research institutions and contract research organizations that conducted and managed pre-clinical studies and clinical trials on the Company's behalf. These estimates were based on the level of service performed and the underlying agreement. Further, the Company accrued expenses related to clinical trials based on the level of patient enrollment and other activities according to the related agreements. The Company monitored patient enrollment levels and other activities to the extent reasonably possible and adjusted estimates accordingly. If actual costs incurred or the timing of services varied from the Company's estimate, the Company adjusted the accrual accordingly. On September 20, 2016, the Company announced its decision to close the ongoing Phase 1 study of MRX34 and halted enrollment and dosing of patients in the study.

Stock-based compensation

The Company accounts for its stock-based compensation awards in accordance with ASC Topic 718, *Compensation—Stock Compensation* ("ASC 718"). ASC 718 requires all stock-based payments to employees, including grants of employee stock options, to be recognized in the statements of operations based on their grant date fair values. For stock options granted to employees and to members of the board of directors for their services on the board of directors, the Company estimates the grant date fair value of each option award using the Black-Scholes option-pricing model. The use of the Black-Scholes option-pricing model requires management to make assumptions with respect to the expected term of the option, the expected volatility of the common stock consistent with the expected life of the option, risk-free interest rates and expected dividend yields of the common stock. For awards subject to service-based vesting conditions, the Company recognizes stock-based compensation expense equal to the grant date fair value of stock options on a straight-line basis over the requisite service period less actual forfeitures.

Restructuring charges

Following the closing of the Phase 1 MRX34 clinical trial, the Company implemented a workforce reduction in the fourth quarter of 2016 to reduce operating expenses while it evaluates strategic alternatives. The majority of severance and benefits payments were settled during the first quarter of 2017. The Company entered into retention agreements with key employees necessary to close the Phase 1 clinical trial of MRX34 and maintain the continued operations of the Company. Under the retention agreements, employees must remain with the Company until June 30, 2017 or until terminated by the Company without cause prior to such date. The Company has recognized the restructuring liability for such retention agreements over the employees' service period.

In accordance with ASC 420, *Exit and Disposal Cost Obligations*, the Company has also recognized contract termination costs in connection with a leased property it intended to occupy as its corporate headquarters and research facility, as well as a temporary lab in use prior to the discontinuation of the Company's research and development activities. In addition, the Company has recognized asset impairments related to its lab equipment

used in the Phase 1 clinical trial, construction in process, and other property and equipment for which the Company does not expect to receive a future benefit.

Fair value measurements

The Company records money market funds at fair value. ASC Topic 820, *Fair Value Measurements and Disclosures*, establishes a fair value hierarchy for those instruments measured at fair value that distinguishes between assumptions based on market data (observable inputs) and the Company's own assumptions (unobservable inputs). The hierarchy consists of three levels:

- Level 1—Unadjusted prices in active markets for identical assets or liabilities.
- Level 2—Quoted prices for similar assets and liabilities in active markets, quoted prices in markets that are not active, or inputs which are observable, either directly or indirectly, for substantially the full term of the asset or liability.
- Level 3—Unobservable inputs that reflect the Company's own assumptions about the assumptions market participants would use in pricing the asset or liability in which there is little, if any, market activity for the asset or liability at the measurement date.

The carrying amounts reflected in the balance sheets for cash, prepaid expenses and other current assets, accounts payable, and accrued expenses approximate their fair values at March 31, 2017 and December 31, 2016, due to their short-term nature.

The Company evaluates transfers between levels at the end of each reporting period. There were no transfers of assets or liabilities between Level 1, Level 2 or Level 3 during the three months ended March 31, 2017 or 2016.

Restricted Cash

Restricted cash consists of cash amounts held for specific or limited purposes and, therefore, not available for general operating activities. In June 2016, the Company secured a standby letter of credit of $2.4 million for the benefit of the landlord for the Company's lease of approximately 23,578 square feet of office and laboratory space in the event of default. The restricted cash consists of cash providing security under the terms of the lease described in Note 10.

As a result of the Lease Termination Agreement and Release described in Note 12, the landlord will release the letter of credit described above to the Company and the balance of restricted cash will be reclassified to cash and cash equivalents.

Marketable Securities

Marketable securities with maturities at purchase beyond one year, but less than twenty-four months, may be classified as short-term marketable securities based on their highly liquid nature and because such marketable securities represent the investment of cash that is available for current operations. Marketable securities with maturities at purchase beyond twenty-four months are classified as non-current. Available-for-sale securities are maintained by an investment manager and may consist of U.S. Treasury securities and government agency securities and corporate debt securities. Available-for-sale securities are carried at fair value with the unrealized gains and losses included in other comprehensive loss as a component of stockholders' equity until realized. Any premium or discount arising at purchase is amortized and/or accreted to interest income and/or expense over the life of the instrument. Realized gains and losses are determined using the specific identification method and are included in other income.

If any adjustment to fair value reflects a decline in value of the investment, the Company considers all available evidence to evaluate the extent to which the decline is "other-than-temporary." If the decline is other-than-temporary, the investment is marked to market through a charge to the Company's statement of operations and comprehensive loss.

Recently Issued and Adopted Accounting Pronouncements

In March 2016, the Financial Accounting Standards Board (FASB) issued ASU 2016-09, *Compensation—Stock Compensation (Topic 718): Improvements to Employee Share Based Payment Accounting* ("ASU 2016-09") as part of the FASB simplification initiative. The new standard provides for changes to accounting for stock compensation including 1) excess tax benefits and tax deficiencies related to share-based payment awards will be recognized as income tax expense in the reporting period in which they occur; 2) excess tax benefits will be classified as an operating activity in the statement of cash flow; 3) the option to elect to estimate forfeitures or account for them when they occur; and 4) increase tax withholding requirements threshold to qualify for equity classification. We adopted ASU 2016-09 in the quarter ended March 31, 2017 with an effective date of January 1, 2017 and made a policy election to account for forfeitures as they occur. In addition, the Company increased both its net operating loss deferred tax asset and its valuation allowance upon adoption of ASU 2016-09. This did not have an impact on net stockholders' equity as the incremental deferred tax assets were fully offset by a corresponding increase in the deferred tax asset valuation allowance as of March 31, 2017. The cumulative effect of adoption was recorded in the quarter ended March 31, 2017 and did not have a material impact on our condensed financial statements.

3. Marketable Securities

The following table summarizes the available-for-sale securities held at March 31, 2017 and December 31, 2016 (in thousands):

	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
March 31, 2017				
U.S. government agency securities and treasuries	$ 39,599	$ —	$ (17)	$ 39,582
Corporate debt securities	826	—	—	826
Total available-for-sale securities	$ 40,425	$ —	$ (17)	$ 40,408

	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
December 31, 2016				
U.S. government agency securities and treasuries	$ 42,516	$ 4	$ (8)	$ 42,512
Corporate debt securities	1,554	—	—	1,554
Total available-for-sale securities	$ 44,070	$ 4	$ (8)	$ 44,066

There were no available-for-sale securities held as of March 31, 2017 that had remaining maturities greater than one year.

4. Fair Value Measurements

The following table sets forth the Company's assets that are measured at fair value on a recurring basis as of March 31, 2017 and December 31, 2016 (in thousands):

	Total	Quoted prices in active markets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
March 31, 2017				
Assets:				
Cash and cash equivalents				
Cash	$ 2,399	$ 2,399	$ —	$ —
Money market funds	14,722	14,722	$ —	$ —
Total cash and cash equivalents	17,121	17,121	—	—
Marketable securities				
U.S. government agency securities and treasuries	39,582	—	39,582	—
Corporate debt securities	826	—	826	—
Total marketable securities	40,408	—	40,408	—
Restricted cash	2,433	2,433	—	—
Total assets	$59,962	$19,554	$ 40,408	$ —

	Total	Quoted prices in active markets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
December 31, 2016				
Assets:				
Cash and cash equivalents				
Cash	$ 2,785	$ 2,785	$ —	$ —
Money market funds	$ 9,647	$ 9,647	$ —	$ —
US government agency securities and treasuries	$ 4,000	—	4,000	
Total cash and cash equivalents	16,432	12,432	4,000	—
Marketable securities				
U.S. government agency securities and treasuries	42,512	—	42,512	—
Corporate debt securities	1,554	—	1,554	—
Total marketable securities	44,066	—	44,066	—
Restricted cash	2,432	2,432	—	—
Total assets	$62,930	$14,864	$ 48,066	$ —

Cash and cash equivalents

The Company considers all highly liquid securities with original final maturities of three months or less from the date of purchase to be cash equivalents. As of March 31, 2017 and December 31, 2016, cash and cash equivalents are comprised of cash, money market accounts, and U.S. government agency securities and treasuries.

Marketable securities

The cost of available-for-sale securities is adjusted for amortization of premiums and accretion of discounts to maturity. At March 31, 2017 and December 31, 2016, the balance in the Company's accumulated other

comprehensive loss was composed solely of activity related to the Company's available-for-sale marketable securities. The Company has not realized material gains or losses on sales of available-for-sale investment securities during any of the periods presented.

As of March 31, 2017, available for sale securities of approximately $40.0 million were in an unrealized loss position of $17,000. The Company has the intent and ability to hold such securities until recovery. The Company determined that there were no material changes in the credit risk of the above investments. The Company did not hold any investments with an other-than-temporary impairment as of March 31, 2017 and December 31, 2016.

5. Property and Equipment

Property and equipment consisted of the following (in thousands):

	March 31, 2017	December 31, 2016
Furniture, computers and equipment	$ 62	$ 385
Accumulated depreciation	(36)	(31)
	$ 26	354

Depreciation expense was approximately $5,000 and $19,000 for the three months ended March 31, 2017 and 2016, respectively.

In February 2017, the Company entered into an Asset Purchase Agreement for the sale of certain of the Company's lab equipment ("Lab Equipment") with a third party for cash consideration of $325,000. The selling price of the Lab Equipment approximated its book value at December 31, 2016.

6. Common Stock

The Company's common stock has the following characteristics:

- The holders of shares of common stock are entitled to one vote for each share of common stock held at all meetings of stockholders.
- The holders of shares of common stock are entitled to receive dividends, if and when declared by the Company's board of directors. Since inception, no cash dividends have been declared.

Offerings

In September 2015, the Company entered into a new grant contract with Cancer Prevention and Research Institute of Texas ("CPRIT"), in connection with an award of approximately $16.8 million. The award was in the form of an agreement by CPRIT to purchase $16.8 million of shares of common stock of the Company in a private placement concurrent with the initial public offering of the Company's common stock. On October 5, 2015, CPRIT purchased 2,395,010 shares of the Company's common stock at $7.00 per share. Net proceeds from the private placement, after related transaction offering costs, were approximately $16.6 million.

In October 2015, the Company issued 6.25 million shares of common stock in an underwritten public offering, with a price of $7.00 per share. The underwriters purchased an additional 704,962 shares of common stock pursuant to their option to purchase additional shares. The Company received aggregate net proceeds of approximately $43.7 million in the public offering, after deducting the underwriting discounts and commissions and estimated offering expenses payable by the Company.

7. Stock Option Plans

2008 Long Term Incentive Plan

During 2008, the Company adopted the 2008 Long Term Incentive Plan, which allows for incentive stock options for its employees and nonqualified stock options (inclusive of restricted stock units and stock appreciation rights) (the "2008 Plan") for employees and nonemployees under which an aggregate of 330,582 stock options and stock purchase rights may be granted. In December 2013, the total amount available for grant under the 2008 Plan was increased by 224,200 to 554,782. In March 2014, the Company's board of directors approved an increase of 115,153 shares available for grant pursuant to the 2008 Plan to 669,935. In March 2015, the total amount of available to grant under the 2008 Plan was increased in conjunction with the Company's offering of Series D preferred stock by 391,650 shares to 1,061,585. Options under the 2008 Plan have a maximum life of 10 years from the date of grant. Options vest at various intervals, as determined by the Company's board of directors at the date of grant.

2015 Equity Incentive Plan

In August 2015, the Company's board of directors approved the 2015 Equity Incentive Award Plan (the "2015 Plan"), which was effective in connection with the pricing of the IPO on September 30, 2015. The 2015 Plan provides for the granting of a variety of stock-based compensation awards, including stock options, stock appreciation rights, restricted stock awards, restricted stock unit awards, deferred stock awards, dividend equivalent awards, stock payment awards, performance awards and other stock-based awards. The 2015 Plan is the successor to the 2008 Plan and the 462,934 options outstanding in the 2008 Plan at March 31, 2017 may be transferred to the 2015 Plan if awards thereunder terminate, expire or lapse for any reason without the delivery of shares to the holder thereof. As of March 31, 2017, 316,932 shares have been transferred from the 2008 Long Term Incentive Plan to the 2015 Equity Incentive Plan for awards that have terminated, expired, or lapsed. Under the 2015 Plan, 1,671,800 shares of the Company's common stock were initially authorized and reserved for issuance. Since inception, an additional 2,083,596 shares of the Company's common stock has been authorized and reserved for issuance, for a total of 4,535,263 authorized for grant under the 2015 Plan at March 31, 2017.

2015 Employee Stock Purchase Plan

In August 2015, the Company's board of directors approved the 2015 Employee Stock Purchase Plan (the "ESPP"), which was effective in connection with the pricing of the IPO on September 30, 2015. The ESPP allows eligible employees to purchase shares of the Company's common stock at a discount through payroll deductions of up to 15% of their eligible compensation, subject to any plan limitations. The ESPP generally provides for set offering periods, and at the end of each offering period, employees are able to purchase shares at 85% of the lower of the fair market value of the Company's common stock on the first trading day of the offering period or on the last trading day of the offering period. Shares available for future purchase under the ESPP were 369,960 at March 31, 2017; however, as of December 2016, the Company has suspended future issuances of the Company's common stock under the ESPP plan.

Stock Option Activity

The Company's stock option activity for the three months ended March 31, 2017 was as follows:

	Number of Shares	Weighted-Average Exercise Price	Weighted-Average Contractual Life (years)
Outstanding at December 31, 2016	1,905,214	$ 5.39	7.49
Granted	—	—	
Exercised	(15,300)	1.65	
Forfeited/canceled	(278,593)	5.52	
Outstanding at March 31, 2017	1,611,321	$ 5.40	8.12
Options exercisable at March 31, 2017	692,798	$ 5.45	7.30

Stock Compensation Expense

Total stock-based compensation expense for the three and three months ended March 31, 2017 was recognized as follows in the statements of comprehensive loss (in thousands):

	Three Months Ended March 31,	
	2017	2016
Research and development expense	$ 41	$ 171
General and administrative expense	323	276
Total stock based compensation	$ 364	$ 447

As of March 31, 2017, there was approximately $2.9 million of unrecognized compensation cost related to the stock options granted under the 2015 Plan, which is expected to be amortized over a weighted-average period of 2.4 years. There were no restricted stock units or stock appreciation rights granted under the 2015 Plan as of March 31, 2017.

8. Income Taxes

The Company has not recorded a provision for income taxes as of March 31, 2017 due to reported net losses since inception.

During the three months ended March 31, 2017 and 2016, the Company had no interest and penalties related to income taxes.

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amount of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. The Company has established a valuation allowance due to uncertainties regarding the realization of deferred tax assets based upon the Company's lack of earnings history. The Company files income tax returns in the U.S. federal and Texas jurisdictions. The statute of limitations for assessment by the Internal Revenue Service ("IRS") is open for tax years ending December 31, 2015, 2014, and 2013, although carryforward attributes that were generated for tax years prior to 2013 may still be adjusted upon examination by the IRS if they either have been, or will be, used in a future period. The 2010 and subsequent tax years remain open and subject to examination by the State of Texas. There are currently no federal or state income tax audits in progress.

9. Restructuring Charges

On September 20, 2016, Mirna announced its decision to close the ongoing Phase 1 study of MRX34 and voluntarily halted the enrollment and dosing of patients in the study. Following the announcement, the Company received verbal notice from the U.S. Food and Drug Administration ("FDA") on September 28, 2016 that its

Investigational New Drug MRX34 had been placed on full clinical hold. Following the Company's announcement and notification from the FDA, the Company's board of directors approved a reduction of the total number of full-time employees from 36 to 12. As of March 31, 2017, the total number of full-time employees was 7. The Company also committed to retention payments to certain key employees if such employees remained with the Company until June 30, 2017 or were terminated by Mirna without cause prior to such date. Total estimated restructuring charges are approximately $7.1 million and are expected to be incurred through June 30, 2017. Cumulative restructuring charges of $7.0 million have been recognized as of March 31, 2017, of which $4.4 million was recognized during the year ended December 31, 2016 and include a non-cash impairment charge of $1.4 million.

Restructuring charges were as follows (in thousands):

	Three months ended March 31,	
	2017	2016
Employee severance and related costs	$ 204	—
Contract termination costs	2,353	—
Total restructuring charges	$ 2,557	—

The accrued restructuring activity for the three months ended March 31, 2017 was as follows (in thousands):

	Employee severance and related costs	Contract Termination Costs	Total
Balance at December 31, 2016	$ 1,097	$ 1,565	$ 2,662
Restructuring charges and adjustments	204	2,353	2,557
Cash payments	(1,219)	(100)	(1,319)
Balance at March 31, 2017	$ 82	$ 3,818	$ 3,900

The total accrued restructuring balance of $3.9 million has been presented as a current liability within accrued expenses.

Employee severance and related costs

Employee severance and benefits costs recorded in restructuring charges for the three months ended March 31, 2017 included $0.2 million in accrued retention costs, which are being ratably recognized over the respective employee's service period.

Contract termination costs

Contract termination costs recorded in restructuring charges for the year ended December 31, 2016 of $1.5 million related to the Company's determination to cease use and not occupy the Company's headquarters and research facility in connection with the lease the Company entered into in June 2016 (see Note 10). In connection with this determination, the Company recorded a liability of $1.6 million, which was equal to the fair value of the lease obligation at the cease-use date of November 20, 2016. The Company estimated the liability for the contract termination costs associated with the lease as of the cease-use date based on the discounted present value of the remaining lease payments, considering future estimated sublease income, estimated broker fees and contractual executory costs.

In May 2017, the Company and its landlord entered into the Lease Settlement (defined in Note 12) to terminate the lease described in Note 10 for consideration of approximately $3.8 million ("the Settlement Amount"). The Lease Settlement is contingent upon the landlord's execution of a new lease with a third party prior to May 30, 2017, which date the landlord may extend, at its sole option, by 60 days. The Company adjusted its liability for contract termination costs to the Settlement Amount, resulting in an adjustment of $2.4 million

recorded in restructuring charges for the three months ended March 31, 2017. See Note 12 for additional discussion surrounding the termination of the lease.

Asset impairment costs

Following the discontinuation of research and development activities and corresponding workforce reduction, the Company determined that certain property and equipment was impaired and recognized an impairment charge of $1.4 million in restructuring expense in the statement of operations for the year ended December 31, 2016. Of the total impairment charge, approximately $555,000 relates to the impairment of the Lab Equipment which was sold for $325,000 in February 2017 (see Note 5). In addition, the Company recognized an impairment of $591,000 during the year ended December 31, 2016 in construction in progress for the Company's planned headquarters and research facility associated with the termination of the lease contract discussed above. Further, following the workforce reduction, the Company sold or donated its remaining office equipment with the exception of nominal office equipment necessary to continue administrative functions and the closure of its Phase 1 clinical trial, resulting in an impairment of furniture, computers and equipment and leasehold improvements of $256,000 recognized during the year ended December 31, 2016.

10. Commitments and Contingencies

Operating Lease

In June 2016, the Company entered into a lease for its corporate headquarters and research facility in Austin, Texas (the "Headquarters") under an operating lease agreement (the "Lease"). The initial term of the Lease is for a 123-month period, with the option to extend the lease for up to two consecutive 60-month terms. In November 2016, following the workforce reduction described in Note 9, the Company determined not to occupy and ceased use of the headquarters and research facility under the Lease. See Note 9 to the financial statements for further information on accounting for the Lease.

The lease provides annual base rent of approximately $600,000 in the first year after a three-month rent free period following the Commencement Date, with subsequent annual increases of approximately 3% in the annual base rent. In connection with the lease, the landlord has provided a tenant improvement allowance of approximately $1.9 million to be used by the Company to build-out certain improvements to the Headquarters. There have been no draws on the improvement allowance as of March 31, 2017.

Mirna has obtained a standby letter of credit for the initial amount of approximately $2.4 million, which may be drawn down by the landlord in the event of default. If Mirna meets certain requirements, the amount due under the Letter of Credit may be reduced to approximately $800,000.

Under the Lease agreement, future minimum payments payable are approximately as follows:

Period ending December 31,		Operating Lease
2017	(nine months)	$ 450,929
2018		614,855
2019		633,364
2020		652,340
2021	and thereafter	4,565,888
Total		$ 6,917,376

In May 2017, the Company and its landlord entered into the Lease Settlement (defined in Note 12) to terminate the Lease for consideration of approximately $3.8 million. See Note 12 for additional discussion surrounding the termination of the Lease.

CPRIT

In August 2010, the Company entered into a grant contract ("2010 Grant Contract") with the Cancer Prevention and Research Institute of Texas (CPRIT), under which it received a $10.3 million commercialization award from the State of Texas through CPRIT. CPRIT was established to expedite innovation and commercialization in the area of cancer research and to enhance access to evidence-based prevention programs and services throughout the State of Texas. The award was a three-year award that was funded annually, and the contract terminated on January 31, 2014, subject to the Company's obligations to make certain payments that survive termination. Under the terms of the award, the Company will be required to pay to CPRIT a portion of the Company's revenues from sales of certain products by the Company, or received from our licensees or sublicensees, at a percentage in the low single digits until the aggregate amount of such payments equals a specified multiple of the grant amount, and thereafter at a rate of less than one percent, subject to the Company's right, under certain circumstances, to make a one-time payment in a specified amount to CPRIT to buy out such payment obligations. The 2010 grant contract also contains a provision that provides for repayment to CPRIT some amount not to exceed the full amount of the grant proceeds under certain specified circumstances involving relocation of our principal place of business outside Texas.

11. Net Loss Per Share Attributable to Common Stockholders

The following table summarizes the computation of basic and diluted net loss per share attributable to common stockholders of the Company (in thousands, except share and per share data):

	Three Months Ended March 31,	
	2017	2016
Net loss attributable to common stockholders—basic and diluted	4,977	6,571
Weighted-average number of common shares—basic and diluted	20,850,494	20,830,555
Net loss per share attributable to common stockholders—basic and diluted	$ (0.24)	$ (0.32)

As of March 31, 2017 and 2016 the Company has excluded 1,611,321 and 1,915,709 potentially dilutive stock options outstanding, respectively, from the computation of diluted weighted average common shares outstanding, prior to the use of the treasury stock method or if-converted method, because including them would have had an anti- dilutive effect due to the losses reported.

As the Company incurred a net loss for the three months ended March 31, 2017 and March 31, 2016 there is no income allocation required under the two-class method or dilution attributed to weighted-average shares outstanding in the computation of diluted loss per share attributable to common stockholders.

12. Subsequent Events

Lease Termination

In May 2017, the Company and G&I VII Encino Trace II LP (the "Landlord") entered into a Lease Termination Agreement and Release (the "Lease Settlement") to terminate the lease described in Note 10 for consideration of approximately $3.8 million (the "Settlement Amount"). This agreement is contingent upon the Landlord's execution of a new lease with a third party prior to May 30, 2017 (the "Contingency Date"). The Landlord may extend the Contingency Date, at its sole option, for a period of up to 60 days. The Lease Settlement includes standard representations and warranties and releases both the Company and the Landlord from their mutual obligations under the Lease, provided, for purposes of the Landlord's release, the Company does not file for bankruptcy or otherwise make an assignment for the benefit of creditors within 90 days of the Landlord's receipt of the Settlement Amount.

SYNLOGIC, LLC
INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

Years Ended December 31, 2016 and 2015 and Three Months Ended March 31, 2017 and 2016

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors
Synlogic, Inc.:

We have audited the accompanying consolidated balance sheets of Synlogic, LLC and its subsidiaries as of December 31, 2016 and 2015, and the related consolidated statements of operations and comprehensive loss, contingently redeemable preferred units and equity, and cash flows for the years then ended. These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States) and in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Synlogic, LLC and its subsidiaries as of December 31, 2016 and 2015, and the results of their operations and their cash flows for the years then ended in conformity with U.S. generally accepted accounting principles.

(signed) KPMG LLP

Cambridge, Massachusetts
June 19, 2017

SYNLOGIC, LLC AND SUBSIDIARIES

Consolidated Balance Sheets
(in thousands, except unit amounts)

	December 31, 2016	December 31, 2015
Assets		
Current assets:		
Cash	$ 14,586	$ 6,179
Prepaid expenses and other current assets	1,477	136
Total current assets	16,063	6,315
Property and equipment, net	3,504	664
Restricted cash	50	50
Other assets	422	338
Total assets	$ 20,039	$ 7,367
Liabilities, Redeemable Preferred Units and Equity		
Current liabilities:		
Accounts payable	$ 988	$ 641
Accrued expenses	2,296	1,273
Deferred revenue	444	444
Deferred rent	255	—
Capital lease obligations	203	66
Total current liabilities	4,186	2,424
Long-term liabilities:		
Deferred revenue, net of current portion	1,112	1,556
Deferred rent, net of current portion	1,061	—
Capital lease obligations, net of current portion	177	27
Total long-term liabilities	2,350	1,583
Commitments and contingencies (note 16)		
Contingently Redeemable Class A Preferred Units		
Issued and outstanding 1,413,039 and 758,874 units as of December 31, 2016 and 2015, respectively	5,000	2,383
Equity		
Class B Preferred Units		
Issued and outstanding 1,861,626 units as of December 31, 2016	13,611	—
Class A Preferred Units		
Issued and outstanding 7,089,713 and 3,464,716 units as of December 31, 2016 and 2015, respectively	25,548	11,048
Common units		
Issued and outstanding 3,339,869 and 3,402,369 units as of December 31, 2016 and 2015, respectively	592	223
Accumulated deficit	(31,248)	(10,294)
Total equity	8,503	977
Total liabilities and equity	$ 20,039	$ 7,367

See accompanying notes to consolidated financial statements.

SYNLOGIC, LLC AND SUBSIDIARIES

Consolidated Statements of Operations and Comprehensive Loss
(in thousands, except unit and per unit amounts)

	Years Ended December 31,	
	2016	2015
Revenue	$ 444	$ —
Operating expenses:		
Research and development	15,010	4,024
General and administrative	6,398	4,500
Total operating expenses	21,408	8,524
Loss from operations	(20,964)	(8,524)
Interest income (expense), net	10	(8)
Net loss	$ (20,954)	$ (8,532)
Net loss per unit attributable to common unit holders—basic and diluted	$ (7.36)	$ (3.13)
Weighted-average common units used in computing net loss per unit attributable to common unit holders—basic and diluted	2,848,081	2,723,630
Comprehensive loss	$ (20,954)	$ (8,532)

See accompanying notes to consolidated financial statements.

SYNLOGIC, LLC AND SUBSIDIARIES

Consolidated Statements of Contingently Redeemable Preferred Units and Equity
(in thousands, except unit amounts)

	Contingently redeemable Class A preferred units		Contingently redeemable Class A preferred stock		Class B preferred units		Class A preferred units		Series A convertible preferred stock	
	Units	Amount	Shares	Amount	Units	Amount	Units	Amount	Shares	Amount
Balance at December 31, 2014	—	$ —	363,636	$ 1,000	—	$ —	—	$ —	1,287,042	$ 3,439
Sale of Series A-2 Convertible Preferred Stock, net of issuance costs of $13	—	—	395,238	1,383	—	—	—	—	1,976,190	6,904
Grant of restricted shares	—	—	—	—	—	—	—	—	—	—
Exercise of stock options	—	—	—	—	—	—	—	—	—	—
Exchange of common and Series A Preferred Stock of Synlogic Inc. for common and Class A Preferred Units of Synlogic, LLC	758,874	2,383	(758,874)	(2,383)	—	—	3,263,232	10,343	(3,263,232)	(10,343)
Sale of Class A-2 Preferred Units, net of issuance costs of $0	—	—	—	—	—	—	201,484	705	—	—
Equity-based compensation expense	—	—	—	—	—	—	—	—	—	—
Net loss	—	—	—	—	—	—	—	—	—	—
Balance at December 31, 2015	758,874	2,383	—	—	—	—	3,464,716	11,048	—	—
Sale of Class A-3 Preferred Units, net of issuance costs of $0	654,165	2,617	—	—	—	—	3,624,997	14,500	—	—
Sale of Class B Preferred Units, net of issuance costs of $317	—	—	—	—	1,861,626	13,611	—	—	—	—
Repurchase of founders' units	—	—	—	—	—	—	—	—	—	—
Equity-based compensation expense	—	—	—	—	—	—	—	—	—	—
Net loss	—	—	—	—	—	—	—	—	—	—
Balance at December 31, 2016	1,413,039	$5,000	—	$ —	1,861,626	$13,611	7,089,713	$25,548	—	$ —

See accompanying notes to consolidated financial statements.

SYNLOGIC, LLC AND SUBSIDIARIES

Consolidated Statements of Contingently Redeemable Preferred Units and Equity (continued)
(in thousands, except unit amounts)

	Common units		Common shares		Additional paid-in capital	Accumulated deficit	Total equity
	Units	Amount	Shares	Amount			
Balance at December 31, 2014	—	$ —	2,700,000	$ —	$ 32	$ (1,762)	$ 1,709
Sale of Series A-2 Convertible Preferred Stock, net of issuance costs of $13	—	—	—	—	—	—	6,904
Grant of restricted shares	—	—	655,494	—	—	—	—
Exercise of stock options	—	—	46,875	—	1	—	1
Exchange of common and Series A Preferred Stock of Synlogic Inc. for common and Class A Preferred Units of Synlogic, LLC	3,402,369	33	(3,402,369)	—	(33)	—	—
Sale of Class A-2 Preferred Units, net of issuance costs of $0	—	—	—	—	—	—	705
Equity-based compensation expense	—	190	—	—	—	—	190
Net loss	—	—	—	—	—	(8,532)	(8,532)
Balance at December 31, 2015	3,402,369	223	—	—	—	(10,294)	977
Sale of Class A-3 Preferred Units, net of issuance costs of $0	—	—	—	—	—	—	14,500
Sale of Class B Preferred Units, net of issuance costs of $317	—	—	—	—	—	—	13,611
Repurchase of founders' units	(62,500)	—	—	—	—	—	—
Equity-based compensation expense	—	369	—	—	—	—	369
Net loss	—	—	—	—	—	(20,954)	(20,954)
Balance at December 31, 2016	3,339,869	$ 592	—	$ —	$ —	$ (31,248)	$ 8,503

See accompanying notes to consolidated financial statements.

SYNLOGIC, LLC AND SUBSIDIARIES

Consolidated Statements of Cash Flows
(in thousands)

	Years Ended December 31,	
	2016	2015
Cash flows from operating activities:		
Net loss	$ (20,954)	$ (8,532)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation	692	117
Loss on disposal of assets	4	—
Equity-based compensation expense	369	190
Changes in operating assets and liabilities:		
Prepaid expenses and other current assets	(1,341)	(334)
Accounts payable and accrued expenses	1,329	1,515
Deferred revenue	(444)	2,000
Deferred rent	21	—
Other assets	(84)	—
Net cash used in operating activities	(20,408)	(5,044)
Cash flows from investing activities:		
Increase in restricted cash	—	(50)
Proceeds from sale of property and equipment	8	—
Purchases of property and equipment	(1,841)	(451)
Net cash used in investing activities	(1,833)	(501)
Cash flows from financing activities:		
Payments on capital lease obligations	(80)	(68)
Proceeds from exercise of stock options and grant of restricted stock	—	1
Proceeds from sale of convertible preferred stock, net of issuance costs	—	8,287
Proceeds from sale of preferred units, net of issuance costs	30,728	705
Net cash provided by financing activities	30,648	8,925
Net increase in cash	8,407	3,380
Cash at beginning of period	6,179	2,799
Cash at end of period	$ 14,586	$ 6,179
Supplemental disclosure of non-cash investing and financing activities:		
Purchase under capital lease	$ 367	$ 161
Cash paid for interest	$ 8	$ 5
Landlord funded allowance for tenant improvements	$ 1,296	$ —
Property and equipment purchases included in accounts payable and accrued expenses	$ 57	$ 16

See accompanying notes to consolidated financial statements.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements

(1) Nature of Business

Organization

Synlogic, LLC, together with its wholly owned and consolidated subsidiaries ("Synlogic" or the "Company") is an early stage biopharmaceutical company focused on discovering and developing Synthetic Biotic™ medicines: a novel class of living medicines to treat a broad range of human diseases ranging from genetic and acquired metabolic disorders to inflammation and cancer. Synlogic applies the principles and tools of synthetic biology to engineer beneficial, probiotic bacteria to perform or deliver critical therapeutic functions, compensating for missing or damaged pathways in patients with these serious diseases. As living medicines, Synthetic Biotic medicines are designed to sense a local disease context within a patient's body and respond by metabolizing toxic substances or delivering combinations of therapeutic factors. Since incorporation, the Company has devoted substantially all of its efforts to the research and development of its product candidates.

The Company was founded and began operations on March 14, 2014, as TMC Therapeutic, Inc., located in Cambridge, Massachusetts. On July 15, 2014, TMC Therapeutics, Inc. changed its name to Synlogic, Inc. On July 2, 2015, the common and preferred shareholders of Synlogic, Inc. executed the Synlogic, LLC Contribution Agreement (the "Contribution Agreement"), which contributed their equity interests in Synlogic, Inc. in exchange for common and preferred units in a newly formed parent company named Synlogic, LLC. In addition, Synlogic IBDCo, Inc. ("IBDCo") was formed as a subsidiary of Synlogic, LLC (the "2015 Reorganization"). In conjunction with the 2015 Reorganization, the Company entered into license, option, and merger agreements with AbbVie S.à.r.l. ("AbbVie") for the development of treatments for inflammatory bowel diseases ("IBD") (Note 12). In May 2017, the Company completed a series of transactions pursuant to which Synlogic, LLC, merged with and into Synlogic, Inc. which continued to exist as the surviving corporation (Note 19).

Risks and Uncertainties

At December 31, 2016, the Company had cash of approximately $14.6 million and an accumulated deficit of approximately $31.2 million. Since its inception, the Company has devoted substantially all of its efforts to business planning, research and development, recruiting management and technical staff, and raising capital, and has primarily financed its operations through the issuance of preferred stock. In the absence of positive cash flows from operations, the Company is highly dependent on its ability to find additional sources of funding in the form of debt or equity financing. The Company secured multiple rounds of new funding including proceeds from:

- the sale of Class A Preferred Units and Contingently Redeemable Class A Preferred Units in February 2016, generating approximately $17.1 million in net proceeds,
- the sale of Class B Preferred Units in February 2016, generating approximately $13.6 million in net proceeds,
- the sale of Class B Preferred Units in March 2017, generating approximately $26.6 million in net proceeds,
- the sale of Series C Convertible Preferred Stock in May 2017, generating approximately $40.4 million in net proceeds,

As a result of the proceeds generated from the recent financings, management believes that the Company has sufficient cash to fund its operations through at least twelve months from the issuance of these financial statements, or the second quarter of 2018.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

As an early stage company, the Company is subject to a number of risks common to other life science companies, including, but not limited to, raising additional capital, development by its competitors of new technological innovations, risk of failure in preclinical studies, safety and efficacy of its product candidates in clinical trials, the regulatory approval process, market acceptance of the Company's products once approved, lack of marketing and sales history, dependence on key personnel and protection of proprietary technology. The Company's therapeutic programs are currently pre-commercial, spanning discovery through early development and will require significant additional research and development efforts, including extensive preclinical and clinical testing and regulatory approval, prior to commercialization of any product candidates. These efforts require significant amounts of additional capital, adequate personnel infrastructure and extensive compliance-reporting capabilities. There can be no assurance that the Company's research and development will be successfully completed, that adequate protection for the Company's intellectual property will be obtained, that any products developed will obtain necessary regulatory approval or that any approved products will be commercially viable. Even if the Company's product development efforts are successful, it is uncertain when, if ever, the Company will generate revenue from product sales. The Company may never achieve profitability, and unless and until it does, it will continue to need to raise additional capital or obtain financing from other sources, such as strategic collaborations or partnerships.

(2) Summary of Significant Accounting Policies

(a) Basis of Presentation

The accompanying consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States ("U.S. GAAP" or "GAAP").

(b) Principles of Consolidation

The accompanying consolidated financial statements include the accounts of the Company and its wholly owned subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

The July 2, 2015 exchange of common and preferred shares of Synlogic, Inc. for common and preferred units in Synlogic, LLC pursuant to the 2015 Reorganization was accounted for based on existing carrying amounts and there was no change to the reporting entity because there was no change in ownership by the investors.

(c) Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of expenses during the reporting period. On an on-going basis, the Company's management evaluates its estimates, including those related to revenue recognition, income taxes including the valuation allowance for deferred tax assets, research and development, accrued expenses, contingencies and equity-based compensation. The Company bases its estimates on historical experience and on various other assumptions that are believed to be reasonable, the results of which form the basis for making judgements about the carrying values of assets and liabilities. Actual results could differ from those estimates. Changes in estimates are reflected in reported results in the period in which they become known.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

(d) Concentration of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk include amounts held as cash and restricted cash. The Company uses a high quality, accredited financial institution to maintain its cash and restricted cash and, accordingly, such funds are subject to minimal credit risk. The Company has not experienced any losses in such accounts and management believes that the Company is not exposed to significant credit risk due to the financial position of the depository institutions in which those deposits are held. The Company has no financial instruments with off-balance sheet risk of loss.

(e) Restricted Cash

The Company held cash of $50,000 at December 31, 2016 and 2015 in a separate restricted bank account as collateral for the Company's credit card program. The Company has classified these deposits as long-term restricted cash on its balance sheet.

(f) Fair Value of Financial Instruments

Certain assets and liabilities are carried at fair value under GAAP. Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. A fair value hierarchy based on three levels of inputs, of which the first two are considered observable and the last is considered unobservable, are used to measure fair value:

- Level 1—Unadjusted quoted prices in active markets for identical assets or liabilities.
- Level 2—Inputs other than Level 1 that are observable, either directly or indirectly, such as quoted prices for similar assets or liabilities; or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.
- Level 3—Significant unobservable inputs including the Company's own assumptions in determining fair value.

There were no financial instruments recorded at fair value as of December 31, 2016 and 2015. The carrying amounts of cash, restricted cash, accounts payable, and accrued expenses approximate their fair values due to their short-term maturities.

(g) Property and Equipment

Property and equipment, including leasehold improvements, are recorded at cost and depreciated over their estimated useful lives using the straight-line method. Repairs and maintenance costs are expensed as incurred, whereas major improvements are capitalized as additions to property and equipment.

Depreciation begins at the time the asset is placed in service. Depreciation is provided over the following estimated useful lives:

Asset classification	Useful life
Computer and office equipment	3 years
Furniture and fixtures	5 years
Laboratory equipment	5 years
Leasehold improvements	Lesser of useful life or remaining lease term

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

(h) Impairment of Long-Lived Assets

Long-lived assets are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of the asset may not be recoverable. When such events occur, the Company compares the carrying amounts of the assets to their undiscounted expected future cash flows. If this comparison indicates that there is impairment, the amount of impairment is calculated as the difference between the carrying value and fair value of the asset. To date, no such impairments have been recognized.

(i) Rent Expense

The Company's lease for its 200 Sidney Street facility in Cambridge, Massachusetts provides for a rent-free period as well as fixed increases in minimum annual rental payments. The total amount of rental payments due over the lease term is being charged to rent expense on a straight-line basis over the term of the lease. Tenant improvement allowances and other incentives are recorded as deferred rent and amortized as a reduction of periodic rent expense, over the term of the lease. Deferred rent consists of the difference between cash payments and the recognition of rent expense on a straight-line basis for the Company's facility.

(j) Research and Development Costs

Costs incurred in the research and development of the Company's product candidates are expensed as incurred. The Company defers and capitalizes nonrefundable advance payments made by the Company for research and development activities until the related goods are received or the related services are performed.

Research and development expenses are comprised of costs incurred in performing research and development activities, including salary and benefits, equity-based compensation expense, laboratory supplies and other direct expenses, facilities expenses, overhead expenses, contractual services and other outside expenses.

(k) Revenue recognition

The Company generates revenue through a collaboration and license arrangement with a strategic partner for the development and commercialization of product candidates.

The Company recognizes revenue in accordance with Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") Topic 605, *Revenue Recognition* ("ASC 605"). Accordingly, revenue is recognized for each unit of accounting when all of the following criteria are met:

- Persuasive evidence of an arrangement exists;
- Delivery has occurred or services have been rendered;
- The seller's price to the buyer is fixed or determinable; and
- Collectability is reasonably assured.

Amounts received prior to satisfying the revenue recognition criteria are recorded as deferred revenue in the Company's consolidated balance sheets. Amounts expected to be recognized as revenue within the 12 months following the balance sheet date are classified as current deferred revenue. Amounts not expected to be recognized as revenue within the 12 months following the balance sheet date are classified as deferred revenue, net of current portion.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

The Company evaluates collaboration agreements with respect to FASB ASC Topic 808, *Collaborative Arrangements*, considering the nature and contractual terms of the arrangement and the nature of its business operations to determine the classification of the transactions. When the Company is an active participant in the activity and exposed to significant risks and rewards dependent on the commercial success of the collaboration, it will record its transactions on a gross basis in the consolidated financial statements and describe the rights and obligations under the collaborative arrangement in the notes to the consolidated financial statements.

Multiple-Element Arrangements

The Company evaluates multiple-element arrangements based on the guidance in FASB ASC Topic 605-25, *Revenue Recognition—Multiple-Element Arrangements* ("ASC 605-25"). Pursuant to this guidance, the Company identifies the deliverables included in the arrangement and determines whether the individual deliverables have value to the customer on a stand-alone basis and represent separate units of accounting or whether they must be accounted for as a combined unit of accounting. This evaluation requires management to make judgments about the individual deliverables and whether such deliverables are separable from the other aspects of the contractual relationship. Deliverables are considered separate units of accounting provided that: (i) the delivered item(s) has value to the customer on a stand-alone basis and (ii) if the arrangement includes a general right of return relative to the delivered item(s), delivery or performance of the undelivered item(s) is considered probable and substantially in the control of the Company. In assessing whether an item has stand-alone value, the Company considers factors such as the research, manufacturing and commercialization capabilities of the collaboration partner; the retention of any key rights by the Company; and the availability of the associated expertise in the general marketplace. In addition, the Company considers whether the collaboration partner can use the other deliverable(s) for their intended purpose without the receipt of the remaining element(s), whether the value of the deliverable is dependent on the undelivered item(s) and whether there are other vendors that can provide the undelivered element(s).

In situations where the Company has identified multiple units of accounting, the arrangement consideration that is fixed or determinable is allocated among the separate units of accounting using the relative selling price method. The Company determines the selling price of a unit of accounting following the hierarchy of evidence prescribed by ASC 605-25. Accordingly, the Company determines the estimated selling price for units of accounting within each arrangement using vendor-specific objective evidence ("VSOE") of selling price, if available; third-party evidence ("TPE") of selling price if VSOE is not available; or best estimate of selling price ("BESP") if neither VSOE nor TPE is available.

Then, the applicable revenue recognition criteria in ASC 605-25 are applied to each of the separate units of accounting to determine the appropriate period and pattern of recognition. The Company recognizes arrangement consideration allocated to each unit of accounting when all of the revenue recognition criteria in ASC 605-25 are satisfied for that particular unit of accounting. The Company will recognize as revenue, upon delivery, arrangement consideration attributed to deliverables that have stand-alone value from the other deliverables to be provided in an arrangement. For deliverables that do not have stand-alone value from the other deliverables to be provided in an arrangement, revenue is recognized over the Company's estimated performance period as the arrangement would be accounted for as a single unit of accounting.

If there is no discernible pattern of performance and/or objectively measurable performance measures do not exist, then the Company recognizes revenue under the arrangement for the single unit of accounting on a straight-line basis over the period the Company is expected to complete its

performance obligations. Alternatively, if the pattern of performance in which the service is provided to the customer can be determined and objectively measurable performance measures exist, then the Company recognizes revenue under the arrangement using the proportional performance method. Revenue recognized is limited to the lesser of the cumulative amount of payments received or the cumulative amount of revenue earned, as determined using the straight-line method or proportional performance method, as applicable.

Milestones

Contingent consideration from research and development activities that is earned upon the achievement of a substantive milestone is recognized in its entirety in the period in which the milestone is achieved. At the inception of an arrangement that includes milestone payments, the Company evaluates whether each milestone is substantive and at risk to both parties on the basis of the contingent nature of the milestone. This evaluation includes an assessment of whether: (i) the consideration is commensurate with either the Company's performance to achieve the milestone or the enhancement of the value of the delivered item(s) as a result of a specific outcome resulting from the Company's performance to achieve the milestone, (ii) the consideration relates solely to past performance and (iii) the consideration is reasonable relative to all of the deliverables and payment terms within the arrangement. The Company evaluates factors such as the scientific, clinical, regulatory, commercial and other risks that must be overcome to achieve the respective milestone and the level of effort and investment required to achieve the respective milestone in making this assessment. There is considerable judgment involved in determining whether a milestone satisfies all of the criteria required to conclude that a milestone is substantive. The Company recognizes revenue associated with substantive milestones in accordance with FASB ASC Topic 605-28, *Revenue Recognition—Milestone Method* upon successful accomplishment of each milestone, assuming all other revenue recognition criteria are met. Milestones that are not considered substantive would be recognized as revenue over the remaining period of performance, assuming all other revenue recognition criteria are met.

(l) Equity-Based Compensation

The Company measures equity-based compensation to employees and directors based on the grant date fair value of the awards and recognizes the associated expense in the financial statements over the requisite service period of the award, which is generally the vesting period.

Equity-based compensation costs for nonemployee awards are recognized as services are provided, which is generally the vesting period, on a straight-line basis. The measurement date for nonemployee awards is generally the date the performance of services required from the nonemployee is complete. The Company believes that the fair value of the equity is more reliably measurable than the fair value of the services rendered. The fair value of the award granted to a nonemployee is remeasured at each reporting date until performance is completed with any increase or decrease in fair value recorded as equity-based compensation expense.

In determining the exercise price for options granted, the Company's Board of Directors considered the fair value of the common stock as of the grant date. The Board of Directors determined the estimated per share fair value of our common stock at various dates considering contemporaneous valuations performed in accordance with the guidance outlined in the American Institute of Certified Public Accountants Practice Aid, *Valuation of Privately-Held Company Equity Securities Issued as Compensation*, or the Practice Aid. The fair value of the common stock was determined by the Board of Directors at each award grant date based on assumptions, each of which are subjective and generally

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

require judgement and estimation by management, including results obtained from independent third-party valuations, the Company's financial position and historical financial performance, the status of technological developments within the Company's products, the composition and ability of the current research and management team, an evaluation or benchmark of the Company's competition, the current business climate in the marketplace, the illiquid nature of the common stock, arm's length sales of the Company's capital stock (including convertible preferred stock), the effect of the rights and preferences of the preferred share, and the prospects of a liquidity event.

The fair value of each option was estimated on the date of grant or remeasurement using the Black-Scholes option-pricing model. Expected volatility for the Company's common stock was determined based on an average of the historical volatility of a peer-group of similar public companies. The expected term of options granted for employees was calculated using the simplified method, which represented the average of the contractual term of the option and the weighted-average vesting period of the option. The assumed dividend yield is based upon the Company's expectation of not paying dividends in the foreseeable future. The risk-free rate is based upon the U.S. Treasury yield curve commensurate with the expected term at the time of grant or remeasurement. Forfeitures are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from the Company's estimates. Subsequent changes in estimated forfeitures are recognized through a cumulative adjustment in the period of change, and will also impact the amount of share-based compensation expense in future periods. The Company uses historical data to estimate forfeiture rates.

In determining the threshold price for an incentive units, the Company's Board of Directors determines the price at which an incentive unit would have a liquidation value of zero at the date of grant in setting the threshold price for incentive units. The Board of Directors considers the fair value of its assets and performs an analysis to determine the per unit amount that a holder would receive upon a distribution event. In determining the fair value of its assets, the Company relies on independent third-party valuations, which take into account a variety of factors, including the Company's financial position and historical financial performance, the status of technological developments within the Company's products, the composition and ability of the current research and management team, an evaluation or benchmark of the Company's competition, the current business climate in the marketplace, the illiquid nature of the common stock and incentive units, arm's-length sales of the Company's equity, the effect of the rights and preferences of the preferred unit holders, and the prospects of a liquidity event, among others.

The fair value of each incentive unit award is estimated on the date of grant or remeasurement using the Black-Scholes with barrier option-pricing model. Assumptions utilized in the model for valuing the incentive units including expected volatility, dividend yield and risk-free interest rate are arrived at in the same manner as those utilized for the stock option model described above. Additionally, forfeitures are treated in the manner described above. Incentive units do not have an expiration date, thus, the expected term of incentive units granted is determined based on the probability-weighted estimated term to a distribution event.

The Company records the expense for equity grants subject to performance-based milestone vesting over the remaining service period when management determines that achievement of the milestone is probable. Management evaluates when the achievement of a performance-based milestone is probable based on the relative satisfaction of the performance conditions as of the reporting date.

The Company classifies equity-based compensation expense in its consolidated statements of operations in the same manner in which the award recipient's payroll costs are classified or in which the award recipients' service payments are classified.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

(m) Income Taxes

Effective July 2, 2015, the Company was organized as a limited liability company and subject to the provisions of Subchapter K of the Internal Revenue Code. As such, the Company is not viewed as a taxpaying entity in any jurisdiction and does not require a provision for income taxes. Each partner is responsible for the tax liability, if any, related to its proportionate share of the partnership's taxable income.

Each of the wholly owned corporate subsidiaries is a taxpaying entity and does require a provision for income taxes. The wholly owned subsidiaries are considered a brother—sister controlled group and a tax provision has been prepared for each of the subsidiaries individually.

Any reference to a provision for income taxes, deferred income taxes and offsetting valuation allowance represents the aggregate activity of the Company's wholly owned corporations.

The wholly owned corporate subsidiaries, as well as the Company prior to the 2015 Reorganization, account for income taxes under the asset and liability method. Using this method, the Company records deferred tax assets and liabilities for the expected future tax consequences of temporary differences between the Company's financial statement carrying amounts and the tax basis of assets and liabilities using enacted tax rates expected to be in effect in the years in which the differences are expected to reverse. A valuation allowance is provided to reduce the net deferred tax assets to the amount that will more likely than not be realized.

When uncertain tax positions exist, the Company recognizes the tax benefit of tax positions to the extent that the benefit will more likely than not be realized. The determination as to whether the tax benefit will more likely than not be realized is based upon the technical merits of the tax position as well as consideration of the available facts and circumstances.

(n) Net Loss Per Unit

Basic net loss per unit is computed using the weighted-average number of common units outstanding during the period. Diluted net loss per unit is computed using the sum of the weighted-average number of common units outstanding during the period and if dilutive, the weighted-average number of potential common units, including unvested restricted common unit awards.

The Company applies the two-class method to calculate its basic and diluted net loss per unit attributable to common unit holders, as all of its contingently redeemable preferred units and preferred units (together the "Preferred Units") are participating securities. The two-class method is an earnings allocation formula that treats a participating security as having rights to earnings that otherwise would have been available to common unit holders. However, for the periods presented, the two-class method does not impact the net loss per common unit as the Company was in a net loss position for each of the periods presented and holders of the Preferred Units do not participate in losses.

The Company's Preferred Units contractually entitle the holders of such units to participate in dividends but do not contractually require the holders of such units to participate in losses of the Company. Accordingly, for periods in which the Company reports a net loss attributable to common unit holders, diluted net loss per unit attributable to common unit holders is the same as basic net loss per unit attributable to common unit holders, since dilutive common units are not assumed to have been issued if their effect is anti-dilutive.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

(o) Comprehensive Loss

Comprehensive loss is the change in equity of a company during a period from transactions and other events and circumstances, excluding transactions resulting from investments by owners and distributions to owners. The Company's net loss equals comprehensive loss for all periods presented.

(p) Segment Information

Operating segments are defined as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision maker, or decision-making group, in deciding how to allocate resources and in assessing performance. The Company operates in one operating segment: the discovery and development of Synthetic Biotic medicines. The Company's chief executive officer, as chief operating decision maker, manages and allocates resources to the operations of the Company on a total company basis. All of the Company's equipment, leasehold improvements and other fixed assets are physically located within the United States, and all agreements with its partners are denominated in U.S. dollars, except where noted.

(q) Recently Issued Accounting Pronouncements

In May 2014, the FASB issued ASU 2014-09—*Revenue from Contracts with Customers (Topic 606)*, which supersedes all existing revenue recognition requirements, including most industry-specific guidance. This standard is based on the principle that an entity should recognize revenue when it transfers goods or services to customers in an amount that reflects the consideration that the company expects to receive. This standard also requires additional disclosure about the nature, amount, timing and uncertainty of assets recognized from costs incurred to fulfill a contract. It will be effective for annual reporting periods beginning after December 15, 2017, including interim periods within those annual periods. Early adoption is permitted any time after the original effective date, which for the Company is January 1, 2017. Entities have the option of using either a full retrospective or a modified retrospective approach for the adoption of the new standard. The Company is currently assessing the impact that this standard will have on its financial statements and the expected method of transition.

In August 2014, the FASB issued ASU 2014-15—*Presentation of Financial Statements—Going Concern* ("ASU 2014-15"), on disclosure of uncertainties about an entity's ability to continue as a going concern. This guidance addresses management's responsibility in evaluating whether there is substantial doubt about a company's ability to continue as a going concern and to provide related footnote disclosures. The guidance is effective for fiscal years ending after December 15, 2016 and for annual periods and interim periods thereafter, with early adoption permitted. The Company adopted ASU 2014-15 as of December 31, 2016 and it did not have a material effect on its consolidated financial statements.

In February 2015, the FASB issued ASU 2015-02, *Consolidation (Topic 810)* ("ASU 2015-02") to address financial reporting considerations for the evaluation as to the requirement to consolidate certain legal entities. This standard is effective for fiscal years and for interim periods within those fiscal years beginning after December 15, 2015. The Company has evaluated the impact of ASU 2015-02 and has concluded that it has no effect on the consolidated financial statements.

In November 2015, the FASB issued ASU 2015-17—*Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes*, that provides guidance on the presentation of deferred income taxes which requires deferred tax assets and liabilities, along with related valuation allowances, to be classified as noncurrent on the balance sheet. As a result, each tax jurisdiction will now only have one

net noncurrent deferred tax asset or liability. The new guidance does not change the existing requirement that prohibits offsetting deferred tax liabilities from one jurisdiction against deferred tax assets of another jurisdiction. The new guidance is effective for financial statements issued for annual periods beginning after December 15, 2016, and interim periods within those annual periods, with early application permitted. The amendments may be applied either prospectively to all deferred tax liabilities and assets or retrospectively to all periods presented. The Company does not expect the adoption of this standard to have a material impact on its financial statements.

In February 2016, the FASB issued ASU 2016-02—*Leases (Topic 84")*, which replaces the existing accounting guidance for leases. This standard requires entities that lease assets to recognize the assets and liabilities for the rights and obligations created by those leases on the balance sheet. The standard is effective for fiscal years and the interim periods within those fiscal years beginning after December 15, 2018. The guidance is required to be applied by the modified retrospective transition approach and early adoption is permitted. The Company is currently assessing the impact that adoption of this guidance will have on its financial statements and footnote disclosures.

In March 2016, the FASB issued ASU 2016-09—*Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting*. The amendment is to simplify several aspects of the accounting for stock-based payment transactions including the income tax consequences, classification of awards as either equity or liabilities, and classification on the statement of cash flows. The amendments in ASU No. 2016-09 are effective for interim and annual reporting periods beginning after December 15, 2016. The Company does not expect the adoption of this standard to have a material impact on its financial statements.

In November 2016, the FASB issued ASU 2016-18—*Statement of Cash Flows (Topic 230): Restricted Cash*, which requires companies to include cash and cash equivalents that have restrictions on withdrawal or use in total cash and cash equivalents on the statement of cash flows. This ASU is effective for public business entities for annual and interim periods in fiscal years beginning after December 15, 2017. The Company is currently assessing the impact of ASU 2016-18 on its financial statements and related disclosures.

(3) Property and Equipment, net

Property and equipment, net consists of the following (in thousands):

	December 31,	
	2016	2015
Laboratory equipment	$1,534	$ 592
Computer and office equipment	252	65
Furniture and fixtures	220	7
Leasehold improvements	2,308	—
Fixed assets in progress	—	122
	4,314	786
Less accumulated depreciation	(810)	(122)
	$3,504	$ 664

In both 2016 and 2015, the Company entered into a lease for certain laboratory equipment which had a bargain purchase option at the end of the lease term. As such, as of December 31, 2016 and 2015, the Company had approximately $0.5 million and $0.2 million, respectively, of assets under a capital lease with accumulated depreciation of approximately $0.1 million and $32,000, respectively.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

Depreciation expense for the years ended December 31, 2016 and 2015 was $0.7 million and $0.1 million, respectively.

(4) Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets consists of the following (in thousands):

	December 31,	
	2016	2015
Prepaid insurance	$ 71	$ 17
Prepaid research and development	1,163	12
Other prepaid	212	107
Other current assets	31	—
	$1,477	$136

(5) Accrued Expenses

Accrued expenses consists of the following (in thousands):

	December 31,	
	2016	2015
Payroll related	$1,341	$ 819
Professional fees	522	378
Research and development	273	—
Other	160	76
	$2,296	$1,273

(6) Convertible Preferred Stock

(a) Convertible Preferred Stock

Synlogic's Certificate of Incorporation authorized the issuance of up to 7,150,945 shares of Series A Convertible Preferred Stock ("Series A Preferred Stock"). In July 2014 and in September 2014, Synlogic issued and sold 1,143,884 and 363,636 shares, respectively, of Series A-1 Convertible Preferred Stock and Contingently Redeemable Series A-1 Preferred Stock, (together "Preferred Stock"), respectively at $2.75 per share to investors for total net proceeds of approximately $4.0 million. Total Issuance costs related to these transactions of approximately $0.1 million were recorded as a reduction of proceeds within Series A Preferred Stock.

In May 2015, Synlogic sold and issued 1,976,190 shares of Series A-2 Convertible Preferred Stock and 395,238 shares of Contingently Redeemable Series A-2 Preferred Stock at $3.50 per share to investors for total net proceeds of $8.3 million. Issuance costs related to these transactions of $13,000 were recorded as a reduction of proceeds within Series A Preferred Stock.

Pursuant to the July 2, 2015 Contribution Agreement, each share of Synlogic's Series A Preferred Stock and Contingently Redeemable Series A Preferred Stock was exchanged for a like type and number of the Company's Class A Preferred Units and Contingently Redeemable Class A Preferred Units, respectively, (Note 7) and there is no outstanding Preferred Stock at December 31, 2016.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

(b) Rights and Preferences

Preferred Stock had the following rights and preferences:

(i) Voting

The holders of the Preferred Stock were entitled to vote, together with the holders of common stock, on all matters submitted to stockholders for a vote, except with respect to matters on which Delaware General Corporation Law required that a vote would be by a separate class. Each holder of Preferred Stock was entitled to the number of votes equal to the number of common shares into which each preferred share was convertible at the time of such vote.

(ii) Dividends

In the event that a dividend was declared for the holders of common stock, the holders of the Preferred Stock would be entitled to the amount of dividends on an as-converted basis. Through December 31, 2016 and 2015, no dividends were declared or paid.

(iii) Liquidation Preference

In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Company, the holders of shares of Preferred Stock then outstanding would have been entitled to be paid, on a pari passu basis, out of the assets of the Company available for distribution to its stockholders before any payment would have been made to the holders of common stock by reason of their ownership thereof, with respect to each series of Preferred Stock, an amount per share equal to the greater of (i) the applicable original issue price, plus any dividends declared but unpaid thereon, or (ii) such amount per share as would have been payable had all shares been converted into common stock immediately prior to such liquidation, dissolution or winding up of the Company.

If upon any such liquidation, dissolution or winding up of the Company, the assets of the Company available for distribution to its stockholders were insufficient to pay the holders of shares of preferred stock the full amount to which they should have been entitled, the holders of shares of preferred stock would share ratably in any distribution of the assets available for distribution in proportion to the respective amounts that would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full.

(iv) Par Value

Par value was assigned as $0.0001.

(v) Conversion

Each share of preferred stock, at the option of the holder, was convertible into that number of fully paid shares of common stock as determined by dividing the sum of the original issue price ($2.75 for the Series A-1 or $3.50 for the Series A-2), plus any declared but unpaid dividends, by the conversion price in effect at the time of conversion. The initial conversion price for each preferred share was the original issue price, subject to adjustment in accordance with antidilution provisions. Conversion was automatic upon the vote of 70% of the holders of Series A Preferred Stock or immediately upon the closing of a firm commitment underwritten public offering in which the public offering price equals or exceeds $13.75 per share (adjusted to reflect subsequent stock dividends, stock splits, or recapitalization) and the aggregate proceeds raised were not less than $35.0 million.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

(vi) Redemption

The Preferred Stock was not redeemable pursuant to the Series A Convertible Preferred Stock Purchase Agreement except upon a deemed liquidation event. Deemed liquidation events included the merger, acquisition or sale of all or substantially all of the Company's assets. All holders of equally and more subordinated equity instruments of the Company would have been entitled to receive the same form of consideration upon the occurrence of a deemed liquidation event, consequently, the Preferred Stock was classified as permanent equity.

In September 2014, the Company entered into a letter agreement with the Bill & Melinda Gates Foundation ("the Gates Foundation") with respect to the Gates Foundation purchase of 1,413,039 shares of the Company's Series A Preferred Stock. The Gates Foundation investment was made in three tranches of 363,636 shares in September 2014, 395,238 shares in May 2015 and 654,165 shares in February 2016. Under the letter agreement, the Company was required to spend the approximately $5.0 million invested by the Gates Foundation for research on a particular disease, further develop the Company's proprietary technology platform and provide assistance with access to use of such technology in developing countries. If the Company fails to spend the amount appropriately, or defaults under certain other commitments in the agreement and the Company does not cure such default within 90 days of notice, if requested by the Gates Foundation, the Company would be obligated to redeem the shares of Series A Preferred Stock or shares of common stock into which they had converted then held by the Gates Foundation or find a third party to purchase such shares at a price equal to the greater of the initial purchase price and the then current fair value of such shares. In either case, if the Company, over the 6 months following such redemption, sells substantially all of its equity or assets or completes an initial public offering at a value greater than 200% of the price paid upon redemption, then the Company must reimburse the Gates Foundation for the difference.

(c) Participation Rights in Future Equity Issuances

All holders of Preferred Stock had a pro rata right and obligation, based on their percentage equity ownership in the Company, to participate in subsequent issuances of equity securities of the Company approved by 70% vote of holders of Preferred Stock. Should any such holder have chosen not to purchase its full pro rata share, they would have been deemed a defaulting purchaser and all Preferred Stock held by a defaulting purchaser would have been automatically converted into common stock of the Company.

(7) Preferred Units

Preferred Units

The following represent the Preferred Unit transactions of the Company:

- Pursuant to the Contribution Agreement, on July 2, 2015, each share of Synlogic's Series A Preferred Stock and Series A Contingently Redeemable Preferred Stock was exchanged for a like type and number of the Company's Class A Preferred Units and Contingently Redeemable Class A Preferred Units, respectively.
- In November 2015, Synlogic issued and sold an additional 201,484 units of Class A-2 Preferred Units at $3.50 per unit to an investor for net proceeds of approximately $0.7 million. There were no issuance costs related to this transaction.
- In February 2016, Synlogic issued and sold 3,624,997 units of Class A-3 Preferred Units and 654,165 units of Contingently Redeemable Class A-3 Preferred Stock at $4.00 per unit to

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

investors for net proceeds of approximately $17.1 million. There were no issuance costs related to these transactions.

- In February 2016, Synlogic also issued and sold 1,861,626 units of Class B Preferred Units at $7.4818 per unit to investors for net proceeds of approximately $13.6 million. Issuance costs related to this transaction of approximately $0.3 million were recorded as a reduction of proceeds within Class B Preferred Units (together with the Class A Preferred Units, Contingently Redeemable Class A Preferred Units, Class A-2 Preferred Units, Class A-2 Contingently Redeemable Preferred Units, Class A-3 Preferred Units and Contingently Redeemable Class A-3 Preferred Units, the "Preferred Units").

(a) Rights and Preferences

The Preferred Units have substantially similar rights and preferences as were conferred upon the Preferred Stock as follows:

(i) Voting

The holders of the Preferred Units are entitled to vote, together with the holders of the Company's common units as a single class, on all matters submitted to unit holders for a vote. In addition, holders of at least a majority of the outstanding Preferred Units and common units voting as a single class are entitled to take any action required or permitted to be taken at any meeting of the members, unless a different vote is required by the Delaware Limited Liability Company Act or the Company's operating agreement.

(ii) Distributions

Distributions are governed by the Company's operating agreement (Note 11). No distributions were made through December 31, 2016.

(iii) Liquidation Preference

In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Company, the assets of the Company are to be distributed, after the payout or provision for payment of all creditors of the Company, in accordance with the same order of priority as distributions (Note 11).

(iv) Par Value

The Preferred Units do not have a par value.

(v) Redemption

The Preferred Units are not redeemable pursuant to the Series A Convertible Preferred Stock Purchase Agreement, the Synlogic LLC Contribution Agreement and the Class B Preferred Unit Purchase Agreement except upon a deemed liquidation event. Deemed liquidation events include the merger, acquisition or sale of all or substantially all of the Company's assets. All holders of equally and more subordinated equity instruments of the Company would be entitled to receive the same form of consideration upon the occurrence of a deemed liquidation event, consequently, the Preferred Units are classified as permanent equity.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

In September 2014, the Company entered into a letter agreement with the Bill & Melinda Gates Foundation ("the Gates Foundation") with respect to the Gates Foundation purchase of 1,413,039 shares of the Company's Series A Preferred Stock. The Gates Foundation investment was made in three tranches of 363,636 shares in September 2014, 395,238 shares in May 2015 and 654,165 units in February 2016. The first two tranches, totaling 758,874 shares were exchanged for Class A Preferred Units pursuant to the 2015 Reorganization in July 2015. Under the letter agreement, the Company is required to spend the approximately $5.0 million invested by the Gates Foundation for research on a particular disease, further develop the Company's proprietary technology platform and provide assistance with access to use of such technology in developing countries. If the Company fails to spend the amount appropriately, or defaults under certain other commitments in the agreement and the Company does not cure such default within 90 days of notice, if requested by the Gates Foundation, the Company would be obligated to redeem the shares of Series A Preferred Stock or shares of common stock into which they have converted then held by the Gates Foundation or find a third party to purchase such shares at a price equal to the greater of the initial purchase price and the then current fair value of such shares. In either case, if the Company, over the 6 months following such redemption, sells substantially all of its equity or assets or completes an initial public offering at a value greater than 200% of the price paid upon redemption, then the Company must reimburse the Gates Foundation for the difference. As a result, 1,413,039 and 758,874 units of Class A Preferred Units with a cost of approximately $5.0 million and $2.4 million, respectively, were classified as Contingently Redeemable Preferred Units in mezzanine equity, as of December 31, 2016 and 2015, respectively.

(vi) Participation Rights

Holders of Class A Preferred Units have the right and obligation to participate in additional closings of Class A Preferred Units upon the achievement of certain milestones by the Company. If any holder of Class A Preferred Units does not purchase the number of Class A Preferred Units required to be purchased by it at any such additional closing, then each Class A Preferred Unit held by such member shall automatically be converted into common units at the applicable adjustment ratio in effect with respect to such units immediately prior to such closing. To date, all holders of Class A Preferred Units have participated in additional closings at the required levels.

Holders of Class B Preferred Units have the right and obligation to participate in additional closings of Class B Preferred Units upon the achievement of certain milestones by the Company. If any holder of Class B Preferred Units does not purchase the number of Class B Preferred Units required to be purchased by it at any such additional closing, then each Class B Preferred Unit held by such member shall automatically be converted into common units at the applicable adjustment ratio in effect with respect to such units immediately prior to such closing.

(vii) Initial Public Offering

In connection with preparation for an initial public offering, upon request of holder of at least 70% of the Preferred Units, all unit holders will take appropriate steps to implement a reorganization of the Company that may include, for example, contribution of their units to a newly formed corporation.

(8) Common Stock

Synlogic, Inc.'s Certificate of Incorporation authorized the issuance of up to 11,039,567 shares of common stock with a par value of $0.0001. In April 2014, the Company sold a total of 2,700,000 shares of common stock, for consideration totaling approximately $3,000, to four founders and an investor, who were responsible for incubating and forming the Company. The Company holds

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

repurchase options relating to 2,200,000 of these shares at a price equal to the initial purchase price by the founder. The repurchase option is exercisable should the founder cease providing services to the Company prior to the end of a four-year period beginning in April 2014. The Company's repurchase option expires over a four-year period. The common stock of Synlogic was exchanged pursuant to the Contribution Agreement on July 2, 2015. (Note 9).

(9) Common Units

Pursuant to the Contribution Agreement, on July 2, 2015, each share of Synlogic's common stock was exchanged for the same number of common units, substantially conferred with the same rights and responsibilities. The repurchase options, as described in Note 8, continue to remain in effect for the applicable units. Common units do not have a par value and participate in distributions as described in Note 11. As of December 31, 2016, the Company has exercised its repurchase option on 62,500 common units.

(10) Equity-based Compensation and Equity Incentive Plans

(a) Equity Compensation

Equity compensation during the years ended December 31, 2016 and 2015 is derived from a number of equity instruments. In the first half of 2015, stock options were issued to both employees and nonemployees and a restricted stock award was issued to an employee under the Synlogic, Inc. 2014 Stock Incentive Plan ("2014 Stock Incentive Plan"). In July 2015, in connection with the 2015 Reorganization, all outstanding stock options were canceled. In the second half of 2015 and the year ended December 31, 2016, the Company issued incentive units under the Synlogic, LLC 2015 Equity Incentive Plan ("2015 Equity Incentive Plan").

The Company has recorded total equity-based compensation expense of approximately $0.4 million and $0.2 million for the years ended December 31, 2016 and 2015, respectively, which is based on the number of awards ultimately expected to vest.

The following table summarizes equity-based compensation expense within the Company's consolidated statements of operations and comprehensive loss for the years ended December 31, 2016 and 2015 (in thousands):

	Years ended December 31,	
	2016	2015
Research and development	$ 154	$ 16
General and administrative	215	174
	$ 369	$ 190

The following table summarizes equity-based compensation expense by type of award for the years ended December 31, 2016 and 2015 (in thousands):

	Years ended December 31,	
	2016	2015
Stock options	$ —	$ 50
Restricted stock awards	—	17
Incentive units	235	56
Restricted common unit awards	134	67
	$ 369	$ 190

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

(b) Awards Issued under the Synlogic, Inc. 2014 Stock Incentive Plan

(i) Stock Options

The Board of Directors adopted the 2014 Stock Incentive Plan, which provided for the grant of qualified incentive stock options and nonqualified stock options or other awards to the Company's employees, officers, directors, advisors, and outside consultants to purchase up to an aggregate of 1,188,622 shares of the Company's common stock. In April 2015, the Board of Directors authorized an increase in the aggregate shares of the Company's common stock available under the 2014 Stock Incentive Plan to 1,688,622. Awards issued under the 2014 Stock Incentive Plan generally vested 25% after one year and ratably monthly thereafter over a three-year period and expired ten years from the date of grant. In 2015, 176,822 stock options were issued to employees. In July 2015, the 2014 Stock Incentive Plan was terminated, resulting in the cancellation of all issued and outstanding stock options.

In 2014, 582,000 options were issued to nonemployees. The Company used the remaining contractual life to estimate the expected term for options granted to nonemployees. For the year ended December 31, 2015, approximately $26,000 in equity-based compensation expense was recognized associated with nonemployee stock options. No expense was recognized in 2016 as these options were canceled in July 2015 in conjunction with the 2015 Reorganization.

The weighted-average assumptions used in the Black-Scholes option-pricing model for awards issued under the 2014 Stock Incentive Plan since inception were:

	Year ended December 31, 2015	
	Employees	Nonemployees
Expected term (in years)	6.1	8.8 - 9.7
Risk-free interest rate	1.6%	1.9%
Expected volatility	78.9%	78.9%
Dividend yield	0%	0%

The following table represents a summary of stock option activity under the 2014 Stock Incentive Plan:

	Stock options outstanding			
	Number of options	Weighted-average exercise price	Weighted-average remaining contractual term	Intrinsic value
Outstanding at December 31, 2014	667,360	$ 0.26	8.2	$156,000
Granted	176,822	0.49	—	—
Exercised	(46,875)	0.01	—	—
Forfeited	(5,000)	0.49	—	—
Options cancelled upon 2015 Reorganization	(792,307)	0.32	—	—
Outstanding at December 31, 2015	—			$ —

(ii) Restricted Stock Award

The restricted stock award vested 25% after one year and ratably monthly thereafter over the next 36 months, provided the employee remained continuously employed with the Company through each vesting date. The fair value of the restricted stock award was based on methods and assumptions as

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

discussed above. Compensation expense was recognized over the applicable service period. In July 2015, the 2014 Stock Incentive Plan was terminated and no restricted stock awards vested under the 2014 Stock Incentive Plan. Pursuant to the Contribution Agreement, the restricted stock award was exchanged for the same number of common units, substantially conferred with the same rights and responsibilities. The repurchase options continue to remain in effect for the applicable units. Common units do not have a par value and participate in distributions as described in Note 11.

The following table represents a summary of restricted stock activity for awards:

	Restricted stock awards	
	Number of shares	Grant date fair value ($ per share)
Outstanding at December 31, 2014	—	$ —
Granted	655,494	0.82
Forfeited	—	—
Awards exchanged upon 2015 Reorganization	(655,494)	0.82
Outstanding at December 31, 2015	—	$ —

(c) Awards Issued Under the Synlogic, LLC 2015 Equity Incentive Plan

(i) Incentive Units

In October 2015, the Company's Board of Directors adopted the 2015 Equity Incentive Plan, which provides for the grant of equity incentive units to employees, officers, directors or consultants. The awards generally vest 25% after one year and ratably monthly thereafter over the next 36 months. Certain awards provide for accelerated vesting upon a change in control, as defined in the 2015 Equity Incentive Plan. Incentive units do not expire. Holders of incentive units have no voting rights in connection with such incentive units. Each incentive unit is intended to be a profits interest within the meaning of IRS regulations. Each incentive unit has a threshold price, which is the price above which an incentive unit will participate in distributions. In this way, an incentive unit is designed to participate in the future profits and appreciation. Holders of incentive units will be entitled to receive profits when and if distributions are in excess of the threshold price of the award set by the Board of Directors on the date of grant (Note 11).

The Company granted awards under the 2015 Equity Incentive Plan to individuals whose options were terminated under the 2014 Stock Incentive Plan pursuant to the 2015 Reorganization. These newly issued incentive units had similar vesting schedules and strike prices to the canceled awards. The Company treated this as a modification to the original option grant because the cancellation and reissuance was deemed to be concurrent. The calculation of the incremental compensation expense is based on the excess of the fair value of the award measured immediately before and after the modification. Due to the inclusion of the threshold price setting a barrier for participation in distributions, the fair value of an incentive unit is less than the fair value of a stock option valued using similar assumptions. As a result, the Company did not recognize any incremental compensation expense associated with the modification.

During the year ended December 31, 2016, the Company granted 1,317,502 incentive units to employees or directors and 35,000 incentive units to nonemployees. One of the nonemployee grants contains provisions for accelerated vesting upon the achievement of certain performance-based milestones.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

The weighted-average assumptions used in the Black-Scholes with barrier option-pricing model for awards issued under the 2015 Equity Incentive Plan are:

	Year ended December 31, 2016		Year ended December 31, 2015	
	Employee	Nonemployee	Employee	Nonemployee
Expected term (in years)	2.5	0.6 - 3.3	2.9	2.9
Risk-free interest rate	1.1%	0.9%	1.0%	1.1%
Expected volatility	77.0%	71.6%	69.8%	70.0%
Dividend yield	0%	0%	0%	0%

The following table represents a summary of incentive unit activity under the 2015 Equity Incentive Plan during 2016 and 2015:

	Incentive units			
	Number of units	Weighted-average strike price	Weighted-average threshold price	Weighted-average grant date fair value
Nonvested units at December 31, 2014	—	$ —	$ —	$ —
Incentive units replacing cancelled options	792,307	0.32	2.53	0.45
Granted	492,038	1.23	2.53	0.43
Vested	(237,120)	0.30	2.53	0.46
Forfeited	(149,110)	$ 0.63	$ 2.53	$ 0.41
Nonvested units at December 31, 2015	898,115	$ 0.56	$ 2.53	$ 0.49
Granted	1,352,502	3.53	3.53	0.60
Vested	(289,676)	0.93	2.61	0.65
Forfeited	(204,061)	0.56	2.53	0.43
Nonvested units at December 31, 2016	1,756,880	$ 0.56	$ 2.53	$ 0.49
Vested or expected to vest at December 31, 2016	2,065,813	$ 2.28	$ 3.09	$ 0.56

As of December 31, 2016, there was approximately $0.8 million of total unrecognized compensation expense related to unvested incentive units granted to employees under the 2015 Equity Incentive Plan that is expected to be recognized over a weighted-average period of 3.6 years.

In addition, there was approximately $0.3 million in unrecognized compensation expense related to unvested incentive units granted to non-employees that is expected to be recognized over a weighted-average period of 2.2 years. The amount of equity based compensation expense related to nonemployees that will ultimately be recorded will depend on the remeasurement of the outstanding awards through their vesting date.

(ii) Restricted Common Units

In July 2015, pursuant to the Contribution Agreement, the restricted stock award was exchanged for the same number of common units, substantially conferred with the same rights and responsibilities. The purchase options continue to remain in effect and the vesting schedule remains such that 25% vests after one year from the original grant date and vesting continues ratably monthly thereafter over the next 36 months. Compensation expense is recognized over the applicable service period.

The Company treated the cancellation of the restricted stock award issued under the 2014 Stock Incentive Plan and reissuance of restricted common units as a modification to the original award because the cancellation and reissuance were deemed to be concurrent. The calculation of the

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

incremental compensation expense is based on the excess of the fair value of the award measured immediately before and after the modification. The Company did not recognize any incremental compensation expense associated with the modification as the fair value of the restricted stock award was the same as the fair value of the restricted common unit.

No restricted common unit awards were issued in 2016. During 2016, 259,465 restricted common unit awards vested and approximately $0.1 million in equity based compensation was recognized. Unrecognized compensation expense related to unvested restricted common unit awards as of December 31, 2016 was approximately $0.3 million and is expected to be recognized over a period of approximately 2.4 years.

The following table presents a summary of restricted common unit activity during 2016 and 2015:

	Restricted common units	
	Number of units	Grant date fair value ($ per unit)
Restricted common units at December 31, 2014	—	$ —
Awards exchanged upon 2015 Reorganization	655,494	0.82
Granted	—	—
Forfeited	—	—
Restricted common units at December 31, 2015	655,494	0.82
Granted	—	—
Forfeited	—	—
Restricted common units at December 31, 2016	655,494	$ 0.82
Vested or expected to vest at December 31, 2016	655,494	$ 0.82

(11) Distributions

The Board of Directors has the authority to determine the amount, if any, of proceeds available for distribution to unit holders. In the event that a distribution of proceeds is declared by the Board of Directors, such proceeds are to be distributed in accordance with the following order of priority:

- First, to holders of Class B Preferred Units, pro rata in proportion to their unpaid contributed capital, until such holder has received an amount equal to its capital contribution;
- Second, to holders of Class A Preferred Units and Contingently Redeemable Class A Preferred Units, pro rata in proportion to their unpaid contributed capital, until such holder has received an amount equal to its capital contribution;
- Third, to all holders of Preferred Units, common units and incentive units, pro rata in proportion to the remaining amount to be distributed, until an aggregate amount has been distributed in respect of each Preferred Unit, common unit and incentive unit equal to the greatest aggregate amount per unit distributed in respect of any Preferred Unit under the first and second priority described above; provided, that no holder of an incentive unit shall participate in any distributions until a total amount equal to the threshold price with respect to such incentive unit has been distributed in respect of any common unit outstanding on the date of issuance of such incentive unit subsequent to the issuance of such incentive unit;
- Fourth, to each holder of certain incentive units for which the Board of Directors has established a strike price, pro rata in proportion to the remaining amount to be distributed, an amount equal to

the difference between the strike price for such incentive unit, and the threshold price for such incentive unit; and

- Thereafter, to all holders of Preferred Units, common units and incentive units, pro rata in proportion to their percentage interest.

No distributions were made through December 31, 2016.

(12) AbbVie Collaboration Agreement

In July 2015 the Company entered into an Agreement and Plan of Merger (the ”Agreement”) with AbbVie under which the Company granted an exclusive option to AbbVie to purchase IBDCo and agreed to collaborate in researching and developing an Investigatory New Drug (“IND”) candidate for the treatment of IBD.

In exchange for the exclusive option to acquire IBDCo, initial research and development services, ongoing patent defense, and participation on the A joint steering committee (“JSC”), AbbVie agreed to pay IBDCo an upfront, nonrefundable cash payment of $2.0 million, which IBDCo received in December 2015. AbbVie also agreed to pay IBDCo up to $16.5 million related to certain development milestones, all of which were considered substantive, as well as an option excise fee upon the execution of their option to buy IBDCo. The agreement also provides for royalty payments and payments upon the achievement of certain clinical, regulatory and commercial milestones.

The Agreement sets forth the Company’s and AbbVie’s respective obligations for development and delivery of an IND candidate package using reasonable commercial efforts. The JSC will make a determination as to the continuation of the collaboration at the achievement of the milestones.

At the inception of the Agreement, the Company identified the following deliverables: (i) an exclusive option to purchase IBDCo, (ii) research and development services and ongoing patent defense, and (iii) participation on the JSC. The Company also identified contingent deliverables related to four research and development milestones, delivery of an IND candidate package milestone, and transfer of ownership of IBDCo upon exercise of the option to buy IBDCo. The contingent deliverables have been excluded from the initial allocation and will be treated as a separate unit of accounting when and if delivered.

The Company concluded that none of the three deliverables identified at the inception of the Agreement has stand-alone value from the other undelivered elements. Accordingly, these deliverables represent a single unit of accounting.

As of December 31, 2016, the only consideration that is fixed and determinable is the nonrefundable upfront payment of $2.0 million. The consideration relates to the three identified deliverables that comprise the single unit of accounting, which will be recognized evenly over the period of performance. The period of performance will be through the option period, which is closely tied to the completion of the research and development collaboration with AbbVie, and has been estimated to be 54 months. The Company will periodically review and, if necessary, revise the estimated period of performance.

During the year ended December 31, 2016, the Company recognized approximately $0.4 million in revenue associated with the Agreement as substantive activities commenced in 2016. As of December 31, 2016, there was approximately $1.6 million of deferred revenue related to the Agreement, which is classified as current or noncurrent in the consolidated balance sheets based on the Company’s estimate of revenue that will be recognized within the next twelve months. All costs

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

associated with the collaboration agreement will be recorded in research and development expense in the consolidated statements of operations and comprehensive loss in the period incurred.

(13) Income Taxes

Deferred taxes are recognized for temporary differences between the basis of assets and liabilities for financial statement and income tax purposes. Deferred tax assets consist of the following (in thousands):

	December 31,	
	2016	2015
Deferred tax assets:		
Net operating loss carryforwards	$ 11,236	$ 3,516
Tax credit carryforwards	957	365
Accrued expenses	170	268
Property and equipment	34	—
Deferred rent	516	—
Other	321	230
Gross deferred tax assets	13,234	4,379
Deferred tax liability:		
Property and equipment	—	(17)
Deferred revenue	(174)	—
Valuation allowance	(13,060)	(4,362)
Net deferred tax assets	$ —	$ —

Management of the Company has evaluated the positive and negative evidence bearing upon the realizability of the Company's deferred tax assets, which are comprised principally of net operating loss carryforwards, and determined that it is more likely than not that the Company will not recognize the benefits of the deferred tax assets. As a result, a full valuation allowance of approximately $13.1 million and $4.4 million was established at December 31, 2016 and 2015, respectively.

A reconciliation of income tax expense computed at the statutory federal income tax rate to income taxes as reflected in the financial statements is as follows (dollars in thousands):

	Years ended December 31,			
	2016		2015	
	Amount	Tax Rate	Amount	Tax Rate
Income tax benefit using U.S. federal statutory rate	$(7,125)	34%	$(2,902)	34%
State income taxes, net of federal benefit	(1,078)	5%	(438)	5%
Other permanent differences	100	— %	30	— %
Foreign rate differential	—	— %	—	— %
Tax credits	(591)	3%	(291)	3%
Other items	(4)	— %	3	— %
Net change in valuation allowance	8,698	(42)%	3,598	(42)%
Income tax expense (benefit)	$ —	—%	$ —	—%

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

A roll-forward of the valuation allowance for the years ended December 31, 2016 and 2015 is as follows (in thousands):

	Years ended December 31,	
	2016	2015
Balance at beginning of year	$ (4,362)	$ (764)
Increase in valuation allowance	(8,698)	(3,598)
Balance at end of year	$(13,060)	$(4,362)

As of December 31, 2016 and 2015, the Company had federal and state net operating loss carryforwards that may be available to reduce future taxable income of approximately $28.7 million and $8.9 million and approximately $28.2 million and $8.8 million, respectively, which begin to expire in 2034. In addition, at December 31, 2016, the Company had federal and state research and development tax credit carryforwards available to reduce future tax liabilities of approximately $0.7 million and $0.4 million, respectively. These credits begin to expire in 2034 and 2029, respectively.

Pursuant to Section 382 of the Internal Revenue Code of 1986 (“IRC”), certain substantial changes in the Company’s ownership may result in a limitation on the amount of net operating loss (“NOL”) carryforwards and research and development credit (“R&D credit”) carryforwards that may be used in future years. Utilization of the NOL and R&D credit carryforwards may be subject to a substantial annual limitation under Section 382 of the IRC due to ownership change limitations that have occurred previously or that could occur in the future. These ownership changes may limit the amount of NOL and R&D credit carryforwards that can be utilized annually to offset future taxable income and tax, respectively. The Company has not completed a study to assess whether an ownership change has occurred, or whether there have been multiple ownership changes since its formation, due to a significant complexity and related costs associated with such a study. There could be additional ownership changes in the future that may result in additional limitations on the utilization of NOL carryforwards and credits.

The Company adopted the authoritative guidance on accounting for and disclosure of uncertainty in tax positions, which required the Company to determine whether a tax position of the Company is more likely than not to be sustained upon examination, including resolution of any related appeals of litigation processes, based on the technical merits of the position. For tax positions meeting the more likely than not threshold, the tax amount recognized in the financial statements is reduced by the largest benefit that has a greater than fifty percent likelihood of being realized upon the ultimate settlement with the relevant taxing authority. The Company has not recognized any liability for unrecognized tax benefits as of December 31, 2016.

The Company files tax returns, on an entity-level basis, as prescribed by the tax laws of the jurisdictions in which it operates. In the normal course of business, the Company is subject to examination by federal and state jurisdictions, where applicable. There are currently no pending tax examinations. Tax years from 2014 to the present are open to examination under the statute. The Company’s policy is to record interest and penalties related to income taxes as part of the tax provision. There are no interest or penalties accrued at December 31, 2016 and 2015.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

(14) Net Loss per Unit

The following table sets forth the computation of basic and diluted net loss per unit attributable to common unit holders (in thousands, except for unit and per unit amounts):

	Years ended December 31,	
	2016	2015
Numerator:		
Net loss attributable to common unitholders	$ (20,954)	$ (8,532)
Denominator:		
Weighted-average common units outstanding—basic and diluted	2,848,081	2,723,630
Net loss per unit attributable to common unitholders—basic and diluted	$ (7.36)	$ (3.13)

The Company's potentially dilutive units, which include unvested restricted common unit awards, are considered to be common unit equivalents and are only included in the calculation of diluted net loss per unit when their effect is dilutive.

The following potential common units, presented based on amounts outstanding at each period end, were excluded from the calculation of diluted net loss per unit attributable to common unit holders for the periods indicated because including them would have had an anti-dilutive effect:

	As of December 31,	
	2016	2015
Unvested restricted common unit awards	396,029	655,494

(15) Leases

The Company recorded rent expense of approximately $1.0 million and $0.4 million for the years ended December 31, 2016 and 2015, respectively.

Operating Leases

On November 14, 2014, the Company entered into an operating sublease for office space with a termination option at the Company's discretion or when the parties mutually agree. The operating lease provided for annual rent of approximately $0.3 million, payable on a monthly basis. The Company was responsible for real estate taxes, maintenance, and other operating expenses applicable to the leased premises. Additionally, the Company maintained a security deposit of approximately $72,000 with the lessor and recorded the deposit in other assets in its consolidated balance sheet. The Company mutually agreed with the lessor to terminate the sublease effective March 4, 2016.

On July 23, 2015, the Company entered into an operating lease for office and laboratory space in Cambridge, Massachusetts. The operating lease term commenced in February 2016 and expires in April 2021 with a one year renewal option to extend the lease. Rent expense commenced on February 1, 2016 and is recognized on a straight-line basis over the duration of the term. The operating lease provided for annual rent of approximately $0.9 million, payable on a monthly basis, which will increase at a rate of 3% annually, and includes three months of rent abatement during the first year. The Company is responsible for real estate taxes, maintenance, and other operating expenses applicable to the leased premises. Pursuant to the lease, the Company provided a security deposit of approximately $0.2 million to the lessor and recorded the deposit in other assets in its consolidated balance sheet. The

operating lease also provides for a tenant improvement allowance, at the cost of the lessor, not to exceed approximately $1.3 million, all of which was incurred in 2016. The Company was deemed to be the accounting owner of the tenant improvements primarily because it was responsible for project cost overruns. Therefore, the amounts were recorded as a leasehold improvement and deferred rent and are being recorded as a reduction to rent expense ratably over the lease term of 63 months.

Capital Leases

In January 2015, the Company entered into a twenty-four month, non-cancellable lease agreement for approximately $0.2 million for certain lab equipment. Due to the existence of a bargain purchase option, the lease has been accounted for as a capital lease. At December 31, 2016, the interest rate on the outstanding capital lease obligation was approximately 7.6%.

In October 2016, the Company entered into a twenty-four month, non-cancellable lease agreement for approximately $0.4 million for certain lab equipment. Due to the existence of a bargain purchase option, the lease has been accounted for as a capital lease. At December 31, 2016, the interest rate on the outstanding capital lease obligation was approximately 9.6%.

Future minimum lease payments under the Company's operating and capital leases as of December 31, 2016, are as follows (in thousands):

	Operating leases	Capital leases
Fiscal year:		
2017	$ 946	$ 230
2018	975	186
2019	1,004	—
2020	1,034	—
2021	353	—
Thereafter	—	—
Total future minimum lease payments	$ 4,312	$ 416
Less amounts representing interest		36
Capital lease obligations at December 31, 2016		380
Less current portion of capital lease obligations		203
Capital lease obligations, net of current portion		$ 177

(16) Commitments and Contingencies

On November 9, 2015, the Company exercised an option to enter into a license agreement with the Massachusetts Institute of Technology in exchange for $50,000 and reimbursement of prior patent costs of approximately $0.1 million. These amounts were recorded as research and development expense in the year ended December 31, 2016. The agreement will require future maintenance fees totaling approximately $0.1 million through the year ending December 31, 2020 and $50,000 per year thereafter during the period the license is effective, and may also require future payments of up to approximately $1.9 million upon achievement of certain regulatory milestones.

In the ordinary course of business, the Company may be subject to legal proceedings, claims and litigation as the Company operates in an industry susceptible to patent legal claims. The Company

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

accounts for estimated losses with respect to legal proceedings and claims when such losses are probable and estimable. Legal costs associated with these matters are expensed when incurred. The Company is not currently a party to any material legal proceedings.

(17) Employee Benefits

In 2014, the Company adopted a defined contribution 401(k) plan for eligible employees. Employees are eligible to participate in the plan beginning on their date of hire. Under the terms of the plan, employees may make voluntary contributions as a percentage of compensation. The Company has not made any matching contributions since the adoption of the 401(k) plan.

(18) Related-Party Transactions

The Company contracted services from one of its principal investors for the Company's former president and chief executive officer and former chief medical officer who were both employed by the principal investor, as well as employed to support separate portfolio companies of the investor. The Company paid a separate portfolio company approximately $0.1 million relating to reimbursement for a portion of the salary of the former chief medical officer for the year ended December 31, 2016 and $0.1 million relating to reimbursement for a portion of the salary of the former chief executive officer and chief medical officer during the year ended December 31, 2015.

The Company contracted the services of The Orphan Group, which specializes in supporting biotechnology companies in developing therapeutics toward diseases of high unmet medical needs in rare disorders. The Orphan Group is owned by the Company's former chief operating officer. The Company paid the Orphan Group approximately $13,000 and approximately $15,000 for contracted services in the year ended December 31, 2016 and 2015, respectively.

In September 2016, the Company issued a loan to its chief executive officer of approximately $0.2 million which was repaid, including interest which accrued at a rate of 0.6%, in June 2017.

(19) Subsequent Events

The Company has evaluated subsequent events through June 19, 2017, which is the date the financial statements were available to be issued.

In March 2017, the Company sold and issued 3,564,203 units of Class B-2 Preferred Units at $7.4818 per unit to investors for total consideration of approximately $26.6 million, net of offering costs of approximately $18,000. The Class B-2 Preferred Units were issued with substantially the same terms as the existing Class B-1 Preferred Units.

In April 2017, the Company exercised an option associated with the October 2014 agreement with Boston University and the Massachusetts Institute of Technology to acquire a license for certain intellectual property in exchange for $50,000. The execution of this option triggered an equity award for the issuance of 325,377 common units and the Company was required to pay approximately $0.3 million for prior patent costs incurred in connection with the option agreement.

In May 2017, the Company completed a series of transactions ("2017 Reorganization") pursuant to which Synlogic, LLC merged with and into Synlogic, Inc. which continued to exist as the surviving corporation. Pursuant to the 2017 Reorganization, the common units and Preferred Units of Synlogic, LLC, together consisting of Class A Preferred Units, Contingently Redeemable Class A Preferred Units and Class B Preferred Units, were exchanged for common stock and Preferred Stock of Synlogic, Inc. The Synlogic Preferred Stock has substantially similar rights and preferences as the Preferred Units, except that the Preferred Stock is convertible into common stock at the option of the holder, on a one-for-one basis, subject to an antidilution adjustment. Conversion of the Preferred Stock is automatically triggered upon a firm-commitment underwritten public offering or upon a supermajority preferred interest vote.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

In May 2017, the Company adopted the Synlogic, Inc. 2017 Stock Incentive Plan ("2017 Stock Incentive Plan"). Under the 2017 Stock Incentive Plan, Synlogic may grant incentive stock options, non-qualified stock options, restricted and unrestricted stock awards and other stock-based awards. Pursuant to the 2017 Reorganization, Synlogic issued restricted common stock awards under the 2017 Stock Incentive Plan to replace the cancelled incentive units pursuant to the termination of the 2015 Equity Incentive Plan.

In May 2017, the Company sold and issued 5,210,922 shares of Series C Convertible Preferred Stock to investors for total consideration of approximately $40.4 million, net of issuance costs of approximately $1.6 million.

In May 2017, Synlogic entered into a definitive merger agreement with Mirna Therapeutics, Inc. (NASDAQ: MIRN) under which Synlogic will merge with a wholly owned subsidiary of Mirna in an all-stock transaction. The proposed merger remains subject to certain conditions, including the approval of Mirna stockholders. If approved, upon closing of the transaction, Mirna will be renamed Synlogic, Inc.

In May 2017, the Company achieved a development milestone under the AbbVie agreement for which it will receive $2.0 million.

SYNLOGIC, LLC AND SUBSIDIARIES

Unaudited Consolidated Balance Sheets
(in thousands, except unit amounts)

	March 31, 2017	December 31, 2016
Assets		
Current assets:		
Cash	$ 34,146	$ 14,586
Prepaid expenses and other current assets	1,157	1,477
Total current assets	35,303	16,063
Property and equipment, net of accumulated depreciation of $1,033 and $810 as of March 31, 2017 and December 31, 2016, respectively	3,368	3,504
Restricted cash	50	50
Other assets	415	422
Total assets	$ 39,136	$ 20,039
Liabilities, Contingently Redeemable Preferred Units and Equity		
Current liabilities:		
Accounts payable	$ 500	$ 988
Accrued expenses	2,704	2,296
Deferred revenue	444	444
Deferred rent	262	255
Capital lease obligations	190	203
Total current liabilities	4,100	4,186
Long-term liabilities:		
Deferred revenue, net of current portion	1,001	1,112
Deferred rent, net of current portion	991	1,061
Capital lease obligations, net of current portion	130	177
Total long-term liabilities	2,122	2,350
Commitments and contingencies		
Contingently Redeemable Class A Preferred Units		
Issued and outstanding 1,413,039 units as of March 31, 2017 and December 31, 2016	5,000	5,000
Equity		
Class B Preferred Units		
Issued and outstanding 5,425,829 and 1,861,626 units as of March 31, 2017 and December 31, 2016, respectively	40,260	13,611
Class A Preferred Units		
Issued and outstanding 7,089,713 units as of March 31, 2017 and December 31, 2016, respectively	25,548	25,548
Common units		
Issued and outstanding 3,339,869 units as of March 31, 2017 and December 31, 2016	722	592
Accumulated deficit	(38,616)	(31,248)
Total equity	27,914	8,503
Total liabilities and equity	$ 39,136	$ 20,039

See accompanying notes to the unaudited consolidated financial statements.

SYNLOGIC, LLC AND SUBSIDIARIES

Unaudited Consolidated Statements of Operations and Comprehensive Loss
(in thousands, except unit and per unit amounts)

	For the three months ended	
	March 31, 2017	March 31, 2016
Revenue	$ 111	$ 111
Operating expenses:		
Research and development	5,118	2,324
General and administrative	2,367	1,613
Total operating expenses	7,485	3,937
Loss from operations	(7,374)	(3,826)
Interest income (expense), net	6	(2)
Net loss	$ (7,368)	$ (3,828)
Net loss per unit attributable to common unit holders—basic and diluted	$ (2.49)	$ (1.39)
Weighted-average common units used in computing net loss per unit attributable to common unit holders—basic and diluted	2,965,234	2,746,875
Comprehensive loss	$ (7,368)	$ (3,828)

See accompanying notes to the unaudited consolidated financial statements.

SYNLOGIC, LLC AND SUBSIDIARIES

Unaudited Consolidated Statements of Cash Flows
(in thousands)

	Three Months Ended March 31, 2017	Three Months Ended March 31, 2016
Cash flows from operating activities:		
Net loss	$ (7,368)	$ (3,828)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation	222	119
Loss on disposal of assets	—	3
Equity-based compensation expense	130	73
Changes in operating assets and liabilities:		
Prepaid expenses and other current assets	320	(697)
Accounts payable and accrued expenses	(41)	(518)
Deferred revenue	(111)	(111)
Deferred rent	(63)	115
Other assets	7	108
Net cash used in operating activities	(6,904)	(4,736)
Cash flows from investing activities:		
Proceeds from sale of property and equipment	—	4
Purchases of property and equipment	(125)	(669)
Net cash used in investing activities	(125)	(665)
Cash flows from financing activities:		
Payments on capital lease obligations	(60)	(16)
Proceeds from sale of preferred units, net of issuance costs	26,649	30,838
Net cash provided by financing activities	26,589	30,822
Net increase in cash	19,560	25,421
Cash at beginning of period	14,586	6,179
Cash at end of period	$ 34,146	$ 31,600
Supplemental disclosure of non-cash investing activity:		
Cash paid for interest	$ 8	$ 2
Landlord funded allowance for tenant improvements	$ —	$ 1,295
Property and equipment purchases included in accounts payable and accrued expenses	$ 18	$ 762

See accompanying notes to the unaudited consolidated financial statements.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements

(1) Nature of Business

Organization

Synlogic, LLC, together with its wholly owned and consolidated subsidiaries ("Synlogic" or the "Company") is an early stage pharmaceutical company focused on discovering and developing Synthetic Biotic™ medicines: a novel class of living medicines to treat a broad range of human diseases ranging from genetic and acquired metabolic disorders to inflammation and cancer. Synlogic applies the principles and tools of synthetic biology to engineer beneficial, probiotic bacteria to perform or deliver critical therapeutic functions, compensating for missing or damaged pathways in patients with these serious diseases. As living medicines, Synthetic Biotic medicines are designed to sense a local disease context within a patient's body and respond by metabolizing toxic substances or delivering combinations of therapeutic factors. Since incorporation, the Company has devoted substantially all of its efforts to the research and development of its product candidates.

The Company was founded and began operations on March 14, 2014, as TMC Therapeutic, Inc., located in Cambridge, Massachusetts. On July 15, 2014, TMC Therapeutics, Inc. changed its name to Synlogic, Inc. On July 2, 2015, the common and preferred shareholders of Synlogic, Inc. executed the Synlogic, LLC Contribution Agreement (the "Contribution Agreement"), which contributed their equity interests in Synlogic, Inc. in exchange for common and preferred units in a newly formed parent company named Synlogic, LLC. In addition, Synlogic IBDCo, Inc. ("IBDCo") was formed as a subsidiary of Synlogic, LLC ("2015 Reorganization"). In conjunction with the 2015 Reorganization, the Company entered into a merger agreement with AbbVie S.à.r.l. ("AbbVie"), and other agreements, for the development of treatments for inflammatory bowel disease ("IBD") (Note 7). In May 2017, the Company completed a series of transactions pursuant to which Synlogic, LLC, merged with and into Synlogic, Inc. which continued to exist as the surviving corporation (Note 12).

Risks and Uncertainties

At March 31, 2017, the Company had cash of approximately $34.1 million and an accumulated deficit of approximately $38.6 million. Since its inception, the Company has devoted substantially all of its efforts to business planning, research and development, recruiting management and technical staff, and raising capital, and has primarily financed its operations through the issuance of preferred stock. In the absence of positive cash flows from operations, the Company is highly dependent on its ability to find additional sources of funding in the form of debt or equity financing. The Company secured multiple rounds of new funding including proceeds from:

- the sale of Class B Preferred Units in March 2017, generating approximately $26.6 million in net proceeds,
- the sale of Series C Convertible Preferred Stock in May 2017, generating approximately $40.4 million in net proceeds

As a result of the proceeds generated from the recent financings, management believes that the Company has sufficient cash to fund its operations through at least twelve months from the issuance of these financial statements, or the second quarter of 2018.

As an early stage company, the Company is subject to a number of risks common to other life science companies, including, but not limited to, raising additional capital, development by its competitors of new technological innovations, risk of failure in preclinical studies, safety and efficacy of its product candidates in clinical trials, the regulatory approval process, market acceptance of the Company's products once

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

approved, lack of marketing and sales history, dependence on key personnel and protection of proprietary technology. The Company's therapeutic programs are currently pre-commercial, spanning discovery through early development and will require significant additional research and development efforts, including extensive preclinical and clinical testing and regulatory approval, prior to commercialization of any product candidates. These efforts require significant amounts of additional capital, adequate personnel infrastructure and extensive compliance-reporting capabilities. There can be no assurance that the Company's research and development will be successfully completed, that adequate protection for the Company's intellectual property will be obtained, that any products developed will obtain necessary regulatory approval or that any approved products will be commercially viable. Even if the Company's product development efforts are successful, it is uncertain when, if ever, the Company will generate revenue from product sales. The Company may never achieve profitability, and unless and until it does, it will continue to need to raise additional capital or obtain financing from other sources, such as strategic collaborations or partnerships.

(2) Summary of Significant Accounting Policies

(a) Basis of Presentation

The accompanying consolidated financial statements and the related disclosures as of March 31, 2017 and for the three months ended March 31, 2017 and 2016 are unaudited and have been prepared in accordance with accounting principles generally accepted in the United States ("U.S. GAAP" or "GAAP") and the rules and regulations of the Securities Exchange Commission ("SEC") for interim financial statements. Accordingly, they do not include all of the information and notes required by GAAP for complete financial statements. These interim consolidated financial statements should be read in conjunction with the Company's 2016 and 2015 audited consolidated financial statements and notes thereto. The December 31, 2016 consolidated balance sheet included herein was derived from the audited financial statements as of that date, but does not include all disclosures including notes required by GAAP for complete financial statements. In the opinion of management, the unaudited interim consolidated financial statements reflect all adjustments, consisting of normal and recurring adjustments, necessary for the fair presentation of the Company's financial position and results of operations for the three months ended March 31, 2017 and 2016. The results of operations for the interim periods are not necessarily indicative of the results to be expected for the year ending December 31, 2017 or any other interim period or future year or period.

(b) Principles of Consolidation

The accompanying consolidated financial statements include the accounts of the Company and its wholly owned subsidiaries. All intercompany accounts and transactions have been eliminated in consolidation.

(c) Use of Estimates

The preparation of financial statements in accordance with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of expenses during the reporting period. On an on-going basis, the Company's management evaluates its estimates, including those related to revenue recognition, income taxes including the valuation allowance for deferred tax assets, research and development, accrued expenses, contingencies and equity-based compensation. The Company bases its estimates on historical

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

experience and on various other assumptions that are believed to be reasonable, the results of which form the basis for making judgements about the carrying values of assets and liabilities. Actual results could differ from those estimates. Changes in estimates are reflected in reported results in the period in which they become known.

(d) Concentration of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk include amounts held as cash and restricted cash. The Company uses a high quality, accredited financial institution to maintain its cash and restricted cash, and accordingly, such funds are subject to minimal credit risk. The Company has not experienced any losses in such accounts and management believes that the Company is not exposed to significant credit risk due to the financial position of the depository institutions in which those deposits are held. The Company has no financial instruments with off-balance sheet risk of loss.

(e) Recently Issued Accounting Pronouncements

The recently issued accounting pronouncements described in the Company's consolidated financial statements as of and for the year ended December 31, 2016, and the notes thereto have had no material changes during the three months ended March 31, 2017.

(3) Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets consists of the following (in thousands):

	March 31, 2017	December 31, 2016
Prepaid insurance	$ 65	$ 71
Prepaid research and development	897	1,163
Other prepaid	161	212
Other current assets	34	31
	$ 1,157	$ 1,477

(4) Accrued Expenses

Accrued expenses consists of the following (in thousands):

	March 31, 2017	December 31, 2016
Payroll related	$ 724	$ 1,341
Professional fees	1,088	522
Research and development	812	273
Other	80	160
	$ 2,704	$ 2,296

(5) Preferred Units

In March 2017, the Company sold and issued 3,564,203 units of Class B-2 Preferred Units at $7.4818 per unit to investors for total consideration of approximately $26.6 million, net of offering costs of

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

approximately $18,000. The Class B-2 Preferred Units were issued with the same terms as the existing Class B-1 Preferred Units.

(6) Equity-based Compensation and Equity Incentive Plans

(a) Equity Compensation

Equity compensation during the periods ended March 31, 2017 and March 31, 2016 is derived from incentive units issued under the Synlogic, LLC 2015 Equity Incentive Plan ("2015 Equity Incentive Plan") and a restricted common stock grant. The Company has recorded total equity-based compensation expense of approximately $0.1 million for both the three months ended March 31, 2017 and 2016, which is based on the number of awards ultimately expected to vest.

The following table summarizes equity-based compensation expense within the Company's consolidated statements of operations and comprehensive loss for the three months ended March 31, 2017 and 2016 (in thousands):

	Three months ended March 31, 2017	Three months ended March 31, 2016
Research and development	$ 59	$ 27
General and administrative	71	46
	$ 130	$ 73

The following table summarizes equity-based compensation expense by type of award for the three months ended March 31, 2017 and 2016 (in thousands):

	Three months ended March 31, 2017	Three months ended March 31, 2016
Incentive units	$ 96	$ 39
Restricted common units	34	34
	$ 130	$ 73

(b) Awards Issued Under the Synlogic, LLC 2015 Equity Incentive Plan

(i) Incentive Units

In October 2015, the Company's Board of Directors adopted the 2015 Equity Incentive Plan, which provides for the grant of equity incentive units to employees, officers, directors or consultants. The awards generally vest 25% after one year and ratably monthly thereafter over the next 36 months. Certain awards provide for accelerated vesting upon a change in control, as defined in the 2015 Equity Incentive Plan. Incentive units do not expire. Holders of incentive units have no voting rights in connection with such incentive units. Each incentive unit is intended to be a profits interest within the meaning of IRS regulations. Each incentive unit has a threshold price, which is the price above which an incentive unit will participate in distributions. In this way, an incentive unit is designed to participate in the future profits and appreciation. Holders of incentive units will be entitled to receive profits when and if distributions are in excess of the threshold price of the award set by the Board of Directors on the date of grant.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

The Company measures and records the value of incentive units granted to non-employees over the period of time that services are provided and, as such, unvested portions are subject to remeasurement at subsequent reporting periods.

During the three months ended March 31, 2017 and 2016, no incentive units were issued.

The following table represents a summary of incentive unit activity under the 2015 Equity Incentive Plan during the three months ended March 31, 2017:

	Incentive units			
	Number of units	Weighted-average strike price	Weighted-average threshold price	Weighted-average grant date fair value
Nonvested units at December 31, 2016	1,756,880	$ 0.56	$ 2.53	$ 0.49
Granted	—	—	—	—
Vested	(96,424)	2.21	3.06	0.72
Forfeited	(209,775)	0.98	2.58	1.10
Nonvested units at March 31, 2017	1,450,681	$ 3.22	$ 3.41	$ 0.61
Vested or expected to vest at March 31, 2017	1,865,917	$ 2.43	$ 3.15	$ 0.56

As of March 31,2017, there was approximately $0.7 million of total unrecognized compensation expense related to unvested incentive units granted to employees under the 2015 Equity Incentive Plan that is expected to be recognized over a weighted-average period of 3.3 years.

In addition, as of March 31, 2017, there was approximately $0.3 million in unrecognized compensation expense related to unvested incentive units granted to non-employees that is expected to be recognized over a weighted-average period of 1.1 years. The amount of equity based compensation expense related to nonemployees that will ultimately be recorded will depend on the remeasurement of the outstanding awards through their vesting date.

(ii) Restricted Common Units

No restricted common unit awards were issued during the three months ended March 31, 2017 and 2016. During the three months ended March 31, 2017 and 2016, 40,968 units and no units vested, respectively, and approximately $0.1 million in equity based compensation was recognized during both periods. Unrecognized compensation expense related to unvested restricted common unit awards as of March 31, 2017 was approximately $0.3 million and is expected to be recognized over a period of approximately 2.2 years.

(7) AbbVie Collaboration Agreement

In July 2015, the Company entered into an Agreement and Plan of Merger (“the Agreement”) with AbbVie under which the Company granted an exclusive option to AbbVie to purchase IBDCo and agreed to collaborate in researching and developing an Investigatory New Drug (“IND”) candidate for the treatment of IBD.

In exchange for the exclusive option to acquire IBDCo, initial research and development services, ongoing patent defense, and participation on the joint steering committee (“JSC”), AbbVie agreed to pay IBDCo an upfront, nonrefundable cash payment of $2.0 million, which IBDCo received in December 2015. AbbVie also agreed to pay IBDCo up to $16.5 million in development milestone

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

payments, all of which were considered substantive, as well as an option exercise fee upon the execution of their option to buy IBDCo. The agreement also provides for royalty payments and payments upon the achievement of certain clinical, regulatory and commercial milestones.

The Agreement sets forth the Company's and AbbVie's respective obligations for development and delivery of an IND candidate package using reasonable commercial efforts. The JSC will make a determination as to the continuation of the collaboration at the achievement of the milestones.

At the inception of the Agreement, the Company identified the following deliverables: (i) an exclusive option to purchase IBDCo, (ii) research and development services and ongoing patent defense, and (iii) participation on the JSC. The Company also identified contingent deliverables related to four research and development milestones, delivery of an IND candidate package milestone, and transfer of ownership of IBDCo upon exercise of the option to buy IBDCo. The contingent deliverables have been excluded from the initial allocation and will be treated as a separate unit of accounting when and if delivered.

The Company concluded that none of the three deliverables identified at the inception of the Agreement has stand-alone value from the other undelivered elements. Accordingly, these deliverables represent a single unit of accounting.

As of March 31, 2017, the only consideration that is fixed and determinable is the nonrefundable upfront payment of $2.0 million. The consideration relates to the three identified deliverables that comprise the single unit of accounting, which will be recognized over the period of performance. The period of performance will be through the option period, which is closely tied to the completion of the research and development collaboration with AbbVie, and has been estimated to be 54 months. The Company will periodically review and, if necessary, revise the estimated period of performance.

During the three months ended March 31, 2017 and 2016, the Company recognized approximately $0.1 million in revenue associated with the Agreement. As of March 31, 2017, there was approximately $1.4 million of deferred revenue related to the Agreement, which is classified as current or noncurrent in the consolidated balance sheets based on the Company's estimate of revenue that will be recognized within the next twelve months. All costs associated with the collaboration agreement will be recorded in research and development expense in the consolidated statements of operations and comprehensive loss in the period incurred.

(8) Income Taxes

The Company is subject to taxation in the U.S. For the three months ended March 31, 2017 and 2016, the Company did not record an income tax provision or benefit.

The Company's reserves related to taxes and its accounting for uncertain tax positions are based on a determination of whether and how much of a tax benefit taken by the Company in its tax filings or positions is more-likely-than-not to be realized following resolution of any potential contingencies present related to the tax benefit.

(9) Net Loss per Unit

Basic net loss per unit is computed using the weighted-average number of common units outstanding during the period. Diluted net loss per unit is computed using the sum of the weighted-average number of common units outstanding during the period and if dilutive, the weighted-average number of potential common units, including unvested restricted common unit awards.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

The Company computed basic and diluted net loss per unit using the two-class method, which gives effect to the impact of outstanding participating securities. As the three months ended March 31, 2017 and 2016 resulted in net losses attributable to common unitholders, there is no income allocation required under the two-class method or dilution attributed to weighted-average units outstanding in the calculation of diluted net loss per unit because the preferred unit holders do not participate in losses of the Company. Accordingly, for periods in which the Company reports a net loss attributable to common unit holders, diluted net loss per unit attributable to common unit holders is the same as basic net loss per unit attributable to common unit holders, since dilutive common units are not assumed to have been issued if their effect is anti-dilutive.

The following table sets forth the computation of basic and diluted net loss per unit attributable to common stockholders (in thousands, except for unit and per unit amounts):

	Three months ended March 31, 2017	Three months ended March 31, 2016
Numerator:		
Net loss attributable to common unitholders	$ (7,368)	$ (3,828)
Denominator:		
Weighted-average common units outstanding—basic and diluted	2,965,234	2,746,875
Net loss per share attributable to common unitholders—basic and diluted	$ (2.49)	$ (1.39)

The Company's potentially dilutive units, which include unvested restricted common unit awards, are considered to be common unit equivalents and are only included in the calculation of diluted net loss per unit when their effect is dilutive.

The following potential common units, presented based on amounts outstanding at each period end, were excluded from the calculation of the diluted net loss per unit attributable to common unit holders for the period indicated because including them would have had an anti-dilutive effect.

	As of March 31, 2017	As of March 31, 2016
Unvested restricted common unit awards	355,061	655,494

(10) Commitments and Contingencies

In the ordinary course of business, the Company may be subject to legal proceedings, claims and litigation as the Company operates in an industry susceptible to patent legal claims. The Company accounts for estimated losses with respect to legal proceedings and claims when such losses are probable and estimable. Legal costs associated with these matters are expensed when incurred. The Company is not currently a party to any material legal proceedings.

(11) Related-Party Transactions

At March 31, 2017, the Company had a loan to its chief executive officer of approximately $0.2 million. The loan was repaid in June 2017, including interest which accrued at a rate of 0.6%.

The Company contracted services from one of its principal investors for the Company's former chief medical officer who was employed by the principal investor, as well as employed to support separate portfolio companies of the investor. The Company made no payments and paid approximately $38,000 related to reimbursement for a portion of the salary of the former chief medical officer for the three months ended March 31, 2017 and 2016, respectively.

SYNLOGIC, LLC AND SUBSIDIARIES

Notes to Consolidated Financial Statements (continued)

The Company contracted the services of The Orphan Group whom specializes in supporting biotechnology companies in developing therapeutics toward diseases of high unmet medical needs in rare disorders. The Orphan Group is owned by the Company's former chief operating officer. The Company made no payments to the Orphan Group and paid approximately $9,000 for contracted services during the three months ended March 31, 2017 and 2016, respectively.

(12) Subsequent Events

The Company has evaluated subsequent events through June 19, 2017, which is the date the financial statements were available to be issued.

In April 2017, the Company exercised an option associated with the October 2014 agreement with Boston University and the Massachusetts Institute of Technology to acquire a license for certain intellectual property in exchange for $50,000. The execution of this option triggered an equity award for the issuance of 325,377 common units and the Company was required to pay approximately $0.3 million for prior patent costs incurred in connection with the option agreement.

In May 2017, the Company completed a series of transactions ("2017 Reorganization") pursuant to which Synlogic, LLC merged with and into Synlogic, Inc. which continued to exist as the surviving corporation. Pursuant to the 2017 Reorganization, the common units and Preferred Units of Synlogic, LLC, together consisting of Class A Preferred Units, Contingently Redeemable Class A Preferred Units and Class B Preferred Units, were exchanged for common stock and Preferred Stock of Synlogic, Inc. The Synlogic Preferred Stock has substantially similar rights and preferences as the Preferred Units, except that the Preferred Stock is convertible into common stock at the option of the holder, on a one-for-one basis, subject to an antidilution adjustment. Conversion of the Preferred Stock is automatically triggered upon a firm-commitment underwritten public offering or upon a supermajority preferred interest vote.

In May 2017, the Company adopted the Synlogic, Inc. 2017 Stock Incentive Plan ("2017 Stock Incentive Plan"). Under the 2017 Stock Incentive Plan, Synlogic may grant incentive stock options, non-qualified stock options, restricted and unrestricted stock awards and other stock-based awards. Pursuant to the 2017 Reorganization, Synlogic issued restricted common stock awards under the 2017 Stock Incentive Plan to replace the cancelled incentive units pursuant to the termination of the 2015 Equity Incentive Plan.

In May 2017, the Company sold and issued 5,210,922 shares of Series C Convertible Preferred Stock to investors for total consideration of approximately $40.4 million, net of issuance costs of approximately $1.6 million

In May 2017, Synlogic entered into a definitive merger agreement with Mirna Therapeutics, Inc. (NASDAQ: MIRN) under which Synlogic will merge with a wholly owned subsidiary of Mirna in an all-stock transaction. The proposed merger remains subject to certain conditions, including the approval of Mirna stockholders. If approved, upon closing of the transaction, Mirna will be renamed Synlogic, Inc.

In May 2017, the Company achieved a development milestone under the Abbvie agreement for which it will receive $2.0 million.

Annex A
Execution Copy

AGREEMENT AND PLAN OF MERGER
AND REORGANIZATION

among:

MIRNA THERAPEUTICS, INC.,
a Delaware corporation;

MEERKAT MERGER SUB, INC.,
a Delaware corporation;

and

SYNLOGIC, INC.,
a Delaware corporation

Dated as of May 15, 2017

Table of Contents

AGREEMENT AND PLAN OF MERGER AND REORGANIZATION

THIS AGREEMENT AND PLAN OF MERGER AND REORGANIZATION (this "***Agreement***") is made and entered into as of May 15, 2017, by and among **MIRNA THERAPEUTICS, INC.,** a Delaware corporation ("***Meerkat***"), **MEERKAT MERGER SUB, INC.**, a Delaware corporation and wholly owned subsidiary of Meerkat ("***Merger Sub***"), and **SYNLOGIC, INC.**, a Delaware corporation (the "***Company***"). Certain capitalized terms used in this Agreement are defined in **Exhibit A**.

RECITALS

A. Meerkat and the Company intend to effect a merger of Merger Sub with and into the Company (the "***Merger***") in accordance with this Agreement and the DGCL. Upon consummation of the Merger, Merger Sub will cease to exist and the Company will become a wholly owned subsidiary of Meerkat.

B. The Parties intend that the Merger qualify as a "reorganization" within the meaning of Section 368(a) of the Code.

C. The Meerkat Board has (i) determined that the Contemplated Transactions are fair to, advisable and in the best interests of Meerkat and its stockholders, (ii) approved and declared advisable this Agreement and the Contemplated Transactions, including the issuance of shares of Meerkat Common Stock to the stockholders of the Company pursuant to the terms of this Agreement and (iii) determined to recommend, upon the terms and subject to the conditions set forth in this Agreement, that the stockholders of Meerkat vote to approve this Agreement and the Contemplated Transactions, including the issuance of shares of Meerkat Common Stock to the stockholders of the Company pursuant to the terms of this Agreement and, if deemed necessary by the Parties, an amendment to Meerkat's certificate of incorporation to effect the Meerkat Reverse Stock Split.

D. The Merger Sub Board has (i) determined that the Contemplated Transactions are fair to, advisable, and in the best interests of Merger Sub and its sole stockholder, (ii) approved and declared advisable this Agreement and the Contemplated Transactions and (iii) determined to recommend, upon the terms and subject to the conditions set forth in this Agreement, that the stockholder of Merger Sub vote to adopt this Agreement and thereby approve the Contemplated Transactions.

E. The Company Board has (i) determined that the Contemplated Transactions are fair to, advisable and in the best interests of the Company and its stockholders, (ii) approved and declared advisable this Agreement and the Contemplated Transactions and (iii) determined to recommend, upon the terms and subject to the conditions set forth in this Agreement, that the stockholders of the Company vote to adopt this Agreement and thereby approve the Contemplated Transactions.

F. Concurrently with the execution and delivery of this Agreement and as a condition and inducement to the Company's willingness to enter into this Agreement, the officers, directors and stockholders of Meerkat listed on Section A of the Meerkat Disclosure Schedule (solely in their capacity as stockholders of Meerkat) are executing support agreements in favor of the Company in substantially the form attached hereto as **Exhibit B** (the "***Meerkat Stockholder Support Agreement***"), pursuant to which such Persons have, subject to the terms and conditions set forth therein, agreed to vote all of their shares of capital stock of Meerkat in favor of the approval of this Agreement and thereby approve the Contemplated Transactions and against any competing proposals.

G. Concurrently with the execution and delivery of this Agreement and as a condition and inducement to Meerkat's willingness to enter into this Agreement, the officers, directors and 5% or greater stockholders (together with their Affiliates) of the Company listed on Section A of the Company Disclosure Schedule (solely in their capacity as stockholders of the Company) are executing support agreements in favor of Meerkat in substantially the form attached hereto as **Exhibit C** (the "***Company Stockholder Support Agreement***"), pursuant

to which such Persons have, subject to the terms and conditions set forth therein, agreed to vote all of their shares of Company Capital Stock in favor of the adoption of this Agreement and thereby approve the Contemplated Transactions and against any competing proposals.

H. Concurrently with the execution and delivery of this Agreement and as a condition and inducement to Meerkat's willingness to enter into this Agreement, the officers, directors and stockholders of the Company listed on Section A of the Company Disclosure Schedule are executing lock-up agreements in substantially the form attached hereto as **Exhibit D** (collectively, the "***Company Lock-Up Agreements***").

I. Concurrently with the execution and delivery of this Agreement and as a condition and inducement to the Company's willingness to enter into this Agreement, the officers, directors and stockholders of Meerkat listed on Section A of the Meerkat Disclosure Schedule are executing lock-up agreements in substantially the form attached hereto as **Exhibit D** (collectively, the "***Meerkat Lock-Up Agreements***").

J. It is expected that the issuance of shares of Meerkat Common Stock to the stockholders of the Company pursuant to the Merger will result in a change of control of Meerkat.

K. It is expected that within two (2) Business Days after the Registration Statement is declared effective under the Securities Act, the holders of shares of Company Capital Stock sufficient to adopt and approve this Agreement and the Merger as required under the DGCL and the Company's certificate of incorporation and bylaws will execute and deliver an action by written consent adopting this Agreement in substantially the form attached hereto as **Exhibit E**, in order to obtain the Required Company Stockholder Vote (each, a "***Company Stockholder Written Consent***" and collectively, the "***Company Stockholder Written Consents***").

L. Concurrently with the execution of this Agreement, the Company completed a private placement of Company Preferred Stock raising an aggregate of $42,000,000 of gross proceeds for the Company.

AGREEMENT

The Parties, intending to be legally bound, agree as follows:

Section 1 Description of Transaction

1.1 The Merger. Upon the terms and subject to the conditions set forth in this Agreement, at the Effective Time, Merger Sub shall be merged with and into the Company, and the separate existence of Merger Sub shall cease. The Company will continue as the surviving corporation in the Merger (the "***Surviving Corporation***").

1.2 Effects of the Merger. The Merger shall have the effects set forth in this Agreement and in the applicable provisions of the DGCL. As a result of the Merger, the Company will become a wholly owned subsidiary of Meerkat.

1.3 Closing; Effective Time. Unless this Agreement is earlier terminated pursuant to the provisions of Section 9.1, and subject to the satisfaction or waiver of the conditions set forth in Sections 6, 7 and 8, the consummation of the Merger (the "***Closing***") shall take place at the offices of Latham & Watkins LLP, 140 Scott Drive, Menlo Park, California 94025, as promptly as practicable (but in no event later than the second Business Day following the satisfaction or waiver of the last to be satisfied or waived of the conditions set forth in Sections 6, 7 and 8, other than those conditions that by their nature are to be satisfied at the Closing, but subject to the satisfaction or waiver of each of such conditions), or at such other time, date and place as Meerkat and the Company may mutually agree in writing. The date on which the Closing actually takes place is referred to as the "***Closing Date***." At the Closing, the Parties shall cause the Merger to be consummated by executing and filing with the Secretary of State of the State of Delaware a certificate of merger with respect to the Merger, satisfying

the applicable requirements of the DGCL and in a form reasonably acceptable to Meerkat and the Company (the "***Certificate of Merger***"). The Merger shall become effective at the time of the filing of such Certificate of Merger with the Secretary of State of the State of Delaware or at such later time as may be specified in such Certificate of Merger with the consent of Meerkat and the Company (the time as of which the Merger becomes effective being referred to as the "***Effective Time***").

1.4 Certificate of Incorporation and Bylaws; Directors and Officers. At the Effective Time:

(a) the certificate of incorporation of the Surviving Corporation shall be amended and restated in its entirety to read identically to the certificate of incorporation of Merger Sub as in effect immediately prior to the Effective Time, until thereafter amended as provided by the DGCL and such certificate of incorporation;

(b) the certificate of incorporation of Meerkat shall be identical to the certificate of incorporation of Meerkat immediately prior to the Effective Time, until thereafter amended as provided by the DGCL and such certificate of incorporation; *provided*, *however*, that at the Effective Time, Meerkat shall file an amendment to its certificate of incorporation to (i) change the name of Meerkat to "Synlogic, Inc.", (ii) effect the Meerkat Reverse Stock Split (to the extent applicable and necessary) and (iii) make such other changes as are mutually agreeable to Meerkat and the Company;

(c) the bylaws of the Surviving Corporation shall be identical to the bylaws of Merger Sub as in effect immediately prior to the Effective Time, until thereafter amended as provided by the DGCL and such bylaws;

(d) the directors and officers of Meerkat, each to hold office in accordance with the certificate of incorporation and bylaws of Meerkat, shall be as set forth in Section 5.15; and

(e) the directors and officers of the Surviving Corporation, each to hold office in accordance with the certificate of incorporation and bylaws of the Surviving Corporation, shall be the directors and officers of Meerkat as set forth in Section 5.15, after giving effect to the provisions of Section 5.15.

1.5 Conversion of Shares.

(a) At the Effective Time, by virtue of the Merger and without any further action on the part of Meerkat, Merger Sub, the Company or any stockholder of the Company or Meerkat:

(i) any shares of Company Capital Stock held as treasury stock or held or owned by the Company or Merger Sub, or any Subsidiary of the Company immediately prior to the Effective Time shall be canceled and retired and shall cease to exist, and no consideration shall be delivered in exchange therefor; and

(ii) subject to Section 1.5(c), each share of Company Capital Stock outstanding immediately prior to the Effective Time (excluding shares to be canceled pursuant to Section 1.5(a)(i) and excluding Dissenting Shares) shall be converted solely into the right to receive a number of shares of Meerkat Common Stock equal to the Exchange Ratio (the "***Merger Consideration***").

(b) If any shares of Company Capital Stock outstanding immediately prior to the Effective Time are unvested or are subject to a repurchase option or a risk of forfeiture under any applicable restricted stock purchase agreement or other similar agreement with the Company, then the shares of Meerkat Common Stock issued in exchange for such shares of Company Capital Stock will to the same extent be unvested and subject to the same repurchase option or risk of forfeiture, and such shares of Meerkat Common Stock shall accordingly be marked with appropriate legends. The Company shall take all actions that may be necessary to ensure that, from and after the Effective Time, Meerkat is entitled to exercise any such repurchase option or other right set forth in any such restricted stock purchase agreement or other agreement.

(c) No fractional shares of Meerkat Common Stock shall be issued in connection with the Merger, and no certificates or scrip for any such fractional shares shall be issued. Any holder of Company Capital Stock who

would otherwise be entitled to receive a fraction of a share of Meerkat Common Stock (after aggregating all fractional shares of Meerkat Common Stock issuable to such holder) shall, in lieu of such fraction of a share and upon surrender by such holder of a letter of transmittal in accordance with Section 1.8 and any accompanying documents as required therein, be paid in cash the dollar amount (rounded to the nearest whole cent), without interest, determined by multiplying such fraction by the closing price of a share of Meerkat Common Stock on the NASDAQ Global Market (or such other NASDAQ market on which the Meerkat Common Stock then trades) on the date the Merger becomes effective.

(d) All Company Options outstanding immediately prior to the Effective Time under the Company Plan shall be treated in accordance with Section 5.5.

(e) Each share of common stock, $0.0001 par value per share, of Merger Sub issued and outstanding immediately prior to the Effective Time shall be converted into and exchanged for one validly issued, fully paid and nonassessable share of common stock, $0.0001 par value per share, of the Surviving Corporation. Each stock certificate of Merger Sub evidencing ownership of any such shares shall, as of the Effective Time, evidence ownership of such shares of common stock of the Surviving Corporation.

(f) If, between the date of this Agreement and the Effective Time, the outstanding shares of Company Capital Stock or Meerkat Common Stock shall have been changed into, or exchanged for, a different number of shares or a different class, by reason of any stock dividend, subdivision, reclassification, recapitalization, split (including the Meerkat Reverse Stock Split to the extent such split has not previously been taken into account in calculating the Exchange Ratio), combination or exchange of shares or other like change, the Exchange Ratio shall, to the extent necessary, be equitably adjusted to reflect such change to the extent necessary to provide the holders of Company Capital Stock, Company Options and Meerkat Common Stock with the same economic effect as contemplated by this Agreement prior to such stock dividend, subdivision, reclassification, recapitalization, split, combination or exchange of shares or other like change; *provided*, *however*, that nothing herein will be construed to permit the Company or Meerkat to take any action with respect to Company Capital Stock or Meerkat Common Stock, respectively, that is prohibited or not expressly permitted by the terms of this Agreement.

1.6 Calculation of Net Cash.

(a) Not less than five calendar days prior to the anticipated date for Closing (the "***Anticipated Closing Date***"), Meerkat will deliver to the Company a schedule (the "***Net Cash Schedule***") setting forth, in reasonable detail, Meerkat's good faith, estimated calculation of Net Cash (using an estimate of Meerkat's accounts payable and accrued expenses, in each case as of the Anticipated Closing Date and determined in a manner substantially consistent with the manner in which such items were determined for Meerkat's most recent SEC filings) (the "***Net Cash Calculation***" and the date of delivery of such schedule, the "***Delivery Date***") of Net Cash as of the close of business on the last Business Day prior to the Anticipated Closing Date (the "***Cash Determination Time***") prepared and certified by Meerkat's Chief Financial Officer (or if there is no Chief Financial Officer, the principal accounting officer for Meerkat). Meerkat shall make available to the Company, as reasonably requested by the Company, the work papers and back-up materials used or useful in preparing the Net Cash Schedule and, if requested by the Company, Meerkat's accountants and counsel at reasonable times and upon reasonable notice.

(b) Within three Business Days after the Delivery Date (the last day of such period, the "***Response Date***"), the Company shall have the right to dispute any part of the Net Cash Calculation by delivering a written notice to that effect to Meerkat (a "***Dispute Notice***"). Any Dispute Notice shall identify in reasonable detail the nature and amounts of any proposed revisions to the Net Cash Calculation.

(c) If, on or prior to the Response Date, (i) the Company notifies Meerkat in writing that it has no objections to the Net Cash Calculation or (ii) the Company fails to deliver a Dispute Notice as provided in Section 1.6(b), then the Net Cash Calculation as set forth in the Net Cash Schedule shall be deemed to have been

finally determined for purposes of this Agreement and to represent the Net Cash at the Cash Determination Time for purposes of this Agreement.

(d) If the Company delivers a Dispute Notice on or prior to the Response Date, then Representatives of Meerkat and the Company shall promptly meet and attempt in good faith to resolve the disputed item(s) and negotiate an agreed-upon determination of Net Cash, which agreed upon Net Cash amount shall be deemed to have been finally determined for purposes of this Agreement and to represent the Net Cash at the Cash Determination Time for purposes of this Agreement.

(e) If Representatives of Meerkat and the Company are unable to negotiate an agreed-upon determination of Net Cash as of the Cash Determination Time pursuant to Section 1.6(d) within three calendar days after delivery of the Dispute Notice (or such other period as Meerkat and the Company may mutually agree upon), then any remaining disagreements as to the calculation of Net Cash shall be referred to an independent auditor of recognized national standing jointly selected by Meerkat and the Company (the "***Accounting Firm***"). Meerkat shall promptly deliver to the Accounting Firm the work papers and back-up materials used in preparing the Net Cash Schedule, and Meerkat and the Company shall use commercially reasonable efforts to cause the Accounting Firm to make its determination within ten calendar days of accepting its selection. The Company and Meerkat shall be afforded the opportunity to present to the Accounting Firm any material related to the unresolved disputes and to discuss the issues with the Accounting Firm; *provided, however*, that no such presentation or discussion shall occur without the presence of a Representative of each of the Company and Meerkat. The determination of the Accounting Firm shall be limited to the disagreements submitted to the Accounting Firm. The determination of the amount of Net Cash made by the Accounting Firm shall be made in writing delivered to each of Meerkat and the Company, shall be final and binding on Meerkat and the Company and shall be deemed to have been finally determined for purposes of this Agreement and to represent the Net Cash at the Cash Determination Time for purposes of this Agreement. The Parties shall delay the Closing until the resolution of the matters described in this Section 1.6(e). The fees and expenses of the Accounting Firm shall be allocated between Meerkat and the Company in the same proportion that the disputed amount of the Net Cash that was unsuccessfully disputed by such Party (as finally determined by the Accounting Firm) bears to the total disputed amount of the Net Cash amount. If this Section 1.6(e) applies as to the determination of the Net Cash at the Cash Determination Time described in Section 1.6(a), upon resolution of the matter in accordance with this Section 1.6(e), the Parties shall not be required to determine Net Cash again even though the Closing Date may occur later than the Anticipated Closing Date, except that either Meerkat or the Company may request a redetermination of Net Cash if the Closing Date is more than 30 calendar days after the Anticipated Closing Date.

1.7 Closing of the Company's Transfer Books. At the Effective Time: (a) all shares of Company Capital Stock outstanding immediately prior to the Effective Time shall be treated in accordance with Section 1.5(a), and all holders of certificates representing shares of Company Capital Stock that were outstanding immediately prior to the Effective Time shall cease to have any rights as stockholders of the Company; and (b) the stock transfer books of the Company shall be closed with respect to all shares of Company Capital Stock outstanding immediately prior to the Effective Time. No further transfer of any such shares of Company Capital Stock shall be made on such stock transfer books after the Effective Time. If, after the Effective Time, a valid certificate previously representing any shares of Company Capital Stock outstanding immediately prior to the Effective Time (a "***Company Stock Certificate***") is presented to the Exchange Agent or to the Surviving Corporation, such Company Stock Certificate shall be canceled and shall be exchanged as provided in Sections 1.5 and 1.8.

1.8 Surrender of Certificates.

(a) On or prior to the Closing Date, Meerkat and the Company shall agree upon and select a reputable bank, transfer agent or trust company to act as exchange agent in the Merger (the "***Exchange Agent***"). At the Effective Time, Meerkat shall deposit with the Exchange Agent: (i) evidence of book-entry shares representing the Meerkat Common Stock issuable pursuant to Section 1.5(a) and (ii) cash sufficient to make payments in lieu

of fractional shares in accordance with Section 1.5(c). The Meerkat Common Stock and cash amounts so deposited with the Exchange Agent, together with any dividends or distributions received by the Exchange Agent with respect to such shares, are referred to collectively as the "***Exchange Fund***."

(b) Promptly after the Effective Time, the Parties shall cause the Exchange Agent to mail to the Persons who were record holders of shares of Company Capital Stock that were converted into the right to receive the Merger Consideration: (i) a letter of transmittal in customary form and containing such provisions as Meerkat may reasonably specify (including a provision confirming that delivery of Company Stock Certificates shall be effected, and risk of loss and title to Company Stock Certificates shall pass, only upon delivery of such Company Stock Certificates to the Exchange Agent); and (ii) instructions for effecting the surrender of Company Stock Certificates in exchange for book-entry shares of Meerkat Common Stock. Upon surrender of a Company Stock Certificate to the Exchange Agent for exchange, together with a duly executed letter of transmittal and such other documents as may be reasonably required by the Exchange Agent or Meerkat: (A) the holder of such Company Stock Certificate shall be entitled to receive in exchange therefor book-entry shares representing the Merger Consideration (in a number of whole shares of Meerkat Common Stock) that such holder has the right to receive pursuant to the provisions of Section 1.5(a) (and cash in lieu of any fractional share of Meerkat Common Stock pursuant to the provisions of Section 1.5(c)); and (B) the Company Stock Certificate so surrendered shall be canceled. Until surrendered as contemplated by this Section 1.8(b), each Company Stock Certificate shall be deemed, from and after the Effective Time, to represent only the right to receive book-entry shares of Meerkat Common Stock representing the Merger Consideration (and cash in lieu of any fractional share of Meerkat Common Stock). If any Company Stock Certificate shall have been lost, stolen or destroyed, Meerkat may, in its discretion and as a condition precedent to the delivery of any shares of Meerkat Common Stock, require the owner of such lost, stolen or destroyed Company Stock Certificate to provide an applicable affidavit with respect to such Company Stock Certificate and post a bond indemnifying Meerkat against any claim suffered by Meerkat related to the lost, stolen or destroyed Company Stock Certificate or any Meerkat Common Stock issued in exchange therefor as Meerkat may reasonably request.

(c) No dividends or other distributions declared or made with respect to Meerkat Common Stock with a record date after the Effective Time shall be paid to the holder of any unsurrendered Company Stock Certificate with respect to the shares of Meerkat Common Stock that such holder has the right to receive in the Merger until such holder surrenders such Company Stock Certificate or provides an affidavit of loss or destruction in lieu thereof in accordance with this Section 1.8 (at which time such holder shall be entitled, subject to the effect of applicable abandoned property, escheat or similar laws, to receive all such dividends and distributions, without interest).

(d) Any portion of the Exchange Fund that remains undistributed to holders of Company Stock Certificates as of the date that is 180 days after the Closing Date shall be delivered to Meerkat upon demand, and any holders of Company Stock Certificates who have not theretofore surrendered their Company Stock Certificates in accordance with this Section 1.8 shall thereafter look only to Meerkat for satisfaction of their claims for Meerkat Common Stock, cash in lieu of fractional shares of Meerkat Common Stock and any dividends or distributions with respect to shares of Meerkat Common Stock.

(e) Each of the Exchange Agent, Meerkat and the Surviving Corporation shall be entitled to deduct and withhold from any consideration deliverable pursuant to this Agreement to any holder of any Company Stock Certificate such amounts as are required to be deducted or withheld from such consideration under the Code or under any other applicable Law. To the extent such amounts are so deducted or withheld, and remitted to the appropriate taxing authority, such amounts shall be treated for all purposes under this Agreement as having been paid to the Person to whom such amounts would otherwise have been paid.

(f) No party to this Agreement shall be liable to any holder of any Company Stock Certificate or to any other Person with respect to any shares of Meerkat Common Stock (or dividends or distributions with respect thereto) or for any cash amounts delivered to any public official pursuant to any applicable abandoned property law, escheat law or similar Law.

1.9 Appraisal Rights.

(a) Notwithstanding any provision of this Agreement to the contrary, shares of Company Capital Stock that are outstanding immediately prior to the Effective Time and which are held by stockholders who have exercised and perfected appraisal rights for such shares of Company Capital Stock in accordance with the DGCL (collectively, the "***Dissenting Shares***") shall not be converted into or represent the right to receive the Merger Consideration described in Section 1.5 attributable to such Dissenting Shares. Such stockholders shall be entitled to receive payment of the appraised value of such shares of Company Capital Stock held by them in accordance with the DGCL, unless and until such stockholders fail to perfect or effectively withdraw or otherwise lose their appraisal rights under the DGCL. All Dissenting Shares held by stockholders who shall have failed to perfect or who effectively shall have withdrawn or lost their right to appraisal of such shares of Company Capital Stock under the DGCL shall thereupon be deemed to be converted into and to have become exchangeable for, as of the Effective Time, the right to receive the Merger Consideration attributable to such Dissenting Shares upon their surrender in the manner provided in Section 1.5.

(b) The Company shall give Meerkat prompt written notice of any demands by dissenting stockholders received by the Company, withdrawals of such demands and any other instruments served on the Company and any material correspondence received by the Company in connection with such demands. The Company shall not, without Meerkat's prior written consent, make any payment with respect to, or settle or offer to settle, any such demands, or agree to do any of the foregoing.

1.10 Further Action. If, at any time after the Effective Time, any further action is determined by the Surviving Corporation to be necessary or desirable to carry out the purposes of this Agreement or to vest the Surviving Corporation with full right, title and possession of and to all rights and property of the Company, then the officers and directors of the Surviving Corporation shall be fully authorized, and shall use their and its commercially reasonable efforts (in the name of the Company, in the name of Merger Sub, in the name of the Surviving Corporation and otherwise) to take such action.

1.11 Tax Consequences. For United States federal income tax purposes, the Merger is intended to constitute a reorganization within the meaning of Section 368(a) of the Code. The Parties adopt this Agreement as a "plan of reorganization" within the meaning of Section 1.368-2(g) of the Treasury Regulations.

Section 2 Representations and Warranties of the Company

Subject to Section 10.13(h), except as set forth in the written disclosure schedule delivered by the Company to Meerkat (the "***Company Disclosure Schedule***"), the Company represents and warrants to Meerkat and Merger Sub as follows:

2.1 Due Organization; Subsidiaries; Etc.

(a) Each of the Company and its Subsidiaries is a corporation or other legal entity duly incorporated or otherwise organized, validly existing and in good standing under the laws of the jurisdiction of its incorporation or organization and has all necessary power and authority: (i) to conduct its business in the manner in which its business is currently being conducted; (ii) to own or lease and use its property and assets in the manner in which its property and assets are currently owned or leased and used; and (iii) to perform its obligations under all Contracts by which it is bound.

(b) Each of the Company and its Subsidiaries is duly licensed and qualified to do business, and is in good standing (to the extent applicable in such jurisdiction), under the laws of all jurisdictions where the nature of its business requires such licensing or qualification other than in jurisdictions where the failure to be so qualified individually or in the aggregate would not be reasonably expected to have a Company Material Adverse Effect.

(c) The Company has no Subsidiaries, except for the Entities identified in Section 2.1(c) of the Company Disclosure Schedule; and neither the Company nor any of the Entities identified in Section 2.1(c) of the Company Disclosure Schedule owns any capital stock of, or any equity, ownership or profit sharing interest of any nature in, or controls directly or indirectly, any other Entity other than the Entities identified in Section 2.1(c) of the Company Disclosure Schedule. Neither the Company nor any of its Subsidiaries is and or has otherwise been, directly or indirectly, a party to, member of or participant in any partnership, joint venture or similar business entity. Neither the Company nor any of its Subsidiaries has agreed or is obligated to make, or is bound by any Contract under which it may become obligated to make, any future investment in or capital contribution to any other Entity. Neither the Company nor any of its Subsidiaries has, at any time, been a general partner of, or has otherwise been liable for any of the debts or other obligations of, any general partnership, limited partnership or other Entity.

2.2 Organizational Documents. The Company has delivered to Meerkat accurate and complete copies of the Organizational Documents of the Company and each of its Subsidiaries. Neither the Company nor any of its Subsidiaries is in breach or violation of its Organizational Documents in any material respect.

2.3 Authority; Binding Nature of Agreement. The Company and each of its Subsidiaries have all necessary corporate power and authority to enter into and to perform its obligations under this Agreement and to consummate the Contemplated Transactions. The Company Board has (i) determined that the Contemplated Transactions are fair to, advisable and in the best interests of the Company and its stockholders, (ii) approved and declared advisable this Agreement and the Contemplated Transactions and (iii) determined to recommend, upon the terms and subject to the conditions set forth in this Agreement, that the stockholders of the Company vote to adopt this Agreement and thereby approve the Contemplated Transactions. This Agreement has been duly executed and delivered by the Company and assuming the due authorization, execution and delivery by Meerkat and Merger Sub, constitutes the legal, valid and binding obligation of the Company, enforceable against the Company in accordance with its terms, subject to the Enforceability Exceptions. Prior to the execution of the Company Stockholder Support Agreements, the Company Board approved the Company Stockholder Support Agreements and the transactions contemplated thereby.

2.4 Vote Required. The affirmative vote of (i) the holders of a majority of the shares of Company Common Stock and Company Preferred Stock voting together as a single class and (ii) the holders of 66 2/3% of the Company Preferred Stock voting as a separate class, each outstanding on the record date for the Company Stockholder Written Consent and entitled to vote thereon (the "***Required Company Stockholder Vote***"), is the only vote of the holders of any class or series of Company Capital Stock necessary to adopt and approve this Agreement and approve the Contemplated Transactions.

2.5 Non-Contravention; Consents. Subject to compliance with the HSR Act and any foreign antitrust Law, obtaining the Required Company Stockholder Vote and the filing of the Certificate of Merger required by the DGCL, neither (x) the execution, delivery or performance of this Agreement by the Company, nor (y) the consummation of the Contemplated Transactions, will directly or indirectly (with or without notice or lapse of time):

(a) contravene, conflict with or result in a violation of any of the provisions of the Company's Organizational Documents;

(b) contravene, conflict with or result in a material violation of, or give any Governmental Body or other Person the right to challenge the Contemplated Transactions or to exercise any remedy or obtain any relief under, any Law or any order, writ, injunction, judgment or decree to which the Company or its Subsidiaries, or any of the assets owned or used by the Company or its Subsidiaries, is subject;

(c) contravene, conflict with or result in a material violation of any of the terms or requirements of, or give any Governmental Body the right to revoke, withdraw, suspend, cancel, terminate or modify, any Governmental Authorization that is held by the Company or its Subsidiaries;

(d) contravene, conflict with or result in a violation or breach of, or result in a default under, any provision of any Company Material Contract, or give any Person the right to: (i) declare a default or exercise any remedy under any Company Material Contract; (ii) any material payment, rebate, chargeback, penalty or change in delivery schedule under any Company Material Contract; (iii) accelerate the maturity or performance of any Company Material Contract; or (iv) cancel, terminate or modify any term of any Company Material Contract, except in the case of any non-material breach, default, penalty or modification; or

(e) result in the imposition or creation of any Encumbrance upon or with respect to any asset owned or used by the Company or its Subsidiaries (except for Permitted Encumbrances).

Except for (i) any Consent set forth on Section 2.5 of the Company Disclosure Schedule under any Company Contract, (ii) the Required Company Stockholder Vote, (iii) the filing of the Certificate of Merger with the Secretary of State of the State of Delaware pursuant to the DGCL, (iv) any required filings under the HSR Act and any foreign antitrust Law and (v) such consents, waivers, approvals, orders, authorizations, registrations, declarations and filings as may be required under applicable federal and state securities laws, neither the Company nor any of its Subsidiaries was, is, or will be required to make any filing with or give any notice to, or to obtain any Consent from, any Person in connection with (x) the execution, delivery or performance of this Agreement, or (y) the consummation of the Contemplated Transactions. The Company Board has taken and will take all actions necessary to ensure that the restrictions applicable to business combinations contained in Section 203 of the DGCL are, and will be, inapplicable to the execution, delivery and performance of this Agreement and the Company Stockholder Support Agreements and to the consummation of the Contemplated Transactions. No other state takeover statute or similar Law applies or purports to apply to the Merger, this Agreement, the Company Stockholder Support Agreements or any of the Contemplated Transactions.

2.6 Capitalization, Etc.

(a) The authorized Company Capital Stock as of the date of this Agreement consists of (i) 26,300,000 shares of Company Common Stock, par value $0.0001 per share, of which 4,912,656 shares have been issued and are outstanding as of the date of this Agreement, and (ii) 20,132,055 shares of preferred stock, par value $0.0001 per share, of which (A) 8,502,752 shares have been designated as Series A Preferred Stock, including (x) 1,650,678 shares which have been designated as Series A-1 Preferred Stock, all of which are issued and outstanding as of the date of this Agreement, (y) 2,572,912 shares which have been designated as Series A-2 Preferred Stock, all of which are issued and outstanding as of the date of this Agreement, and (z) 4,279,162 shares which have been designated as Series A-3 Preferred Stock, all of which are issued and outstanding as of the date of this Agreement, (B) 5,425,829 shares which have been designated as Series B Preferred Stock , all of which are issued and outstanding as of the date of this Agreement, and (C) 6,203,474 shares which have been designated as Series C Preferred Stock, 5,210,922 of which are issued and outstanding as of the date of this Agreement. The Series A-1 Preferred Stock, Series A-2 Preferred Stock, Series A-3 Preferred Stock, Series B Preferred Stock and Series C Preferred Stock are collectively referred to herein as the "***Company Preferred Stock***". The Company does not hold any shares of its capital stock in its treasury. Except as contemplated herein, there is no Company Contract relating to the voting or registration of, or restricting any Person from purchasing, selling, pledging or otherwise disposing of (or granting any option or similar right with respect to), any shares of Company Common Stock or Company Preferred Stock.

(b) All of the outstanding shares of Company Common Stock and Company Preferred Stock have been duly authorized and validly issued, and are fully paid and nonassessable and are free of any Encumbrances. None of the outstanding shares of Company Common Stock or Company Preferred Stock is entitled or subject to any preemptive right, right of participation, right of maintenance or any similar right. None of the outstanding shares of Company Common Stock or Company Preferred Stock is subject to any right of first refusal in favor of the Company. The Company is not under any obligation, nor is it bound by any Contract pursuant to which it may become obligated, to repurchase, redeem or otherwise acquire any outstanding shares of Company Common Stock or other securities. Section 2.6(b) of the Company Disclosure Schedule accurately and completely lists all

repurchase rights held by the Company with respect to shares of Company Common Stock (including shares issued pursuant to the exercise of stock options) and specifies which of those repurchase rights are currently exercisable. Each share of Company Preferred Stock is convertible into one share of Company Common Stock.

(c) Except for the Company's 2017 Stock Incentive Plan, as amended (the "***Company Plan***"), the Company does not have any stock option plan or any other plan, program, agreement or arrangement providing for any equity-based compensation for any Person. As of the date of this Agreement, the Company has reserved 3,214,926 shares of Company Common Stock for issuance under the Company Plan, of which 1,962,875 shares have been issued and are currently outstanding, 1,184,785 shares have been reserved for issuance upon exercise of Company Options granted under the Company Plan, and 67,266 shares of Company Common Stock remain available for future issuance pursuant to the Company Plan. Section 2.6(c) of the Company Disclosure Schedule sets forth the following information with respect to each Company Option outstanding as of the date of this Agreement: (i) the name of the optionee; (ii) the number of shares of Company Common Stock subject to such Company Option at the time of grant; (iii) the number of shares of Company Common Stock subject to such Company Option as of the date of this Agreement; (iv) the exercise price of such Company Option; (v) the date on which such Company Option was granted; (vi) the applicable vesting schedule, including the number of vested and unvested shares as of the date of this Agreement; (vii) the date on which such Company Option expires; and (viii) whether such Company Option is an "incentive stock option" (as defined in the Code) or a non-qualified stock option. The Company has made available to Meerkat an accurate and complete copy of the Company Plan and forms of all stock option agreements approved for use thereunder. No vesting of Company Options will accelerate in connection with the closing of the Contemplated Transactions.

(d) Except for the outstanding Company Options set forth on Section 2.6(c) of the Company Disclosure Schedule and except as set forth on Section 2.6(d) of the Company Disclosure Schedule, there is no: (i) outstanding subscription, option, call, warrant or right (whether or not currently exercisable) to acquire any shares of the capital stock or other securities of the Company or any of its Subsidiaries; (ii) outstanding security, instrument or obligation that is or may become convertible into or exchangeable for any shares of the capital stock or other securities of the Company or any of its Subsidiaries; (iii) stockholder rights plan (or similar plan commonly referred to as a "poison pill") or Contract under which the Company or any of its Subsidiaries is or may become obligated to sell or otherwise issue any shares of its capital stock or any other securities; or (iv) condition or circumstance that may give rise to or provide a basis for the assertion of a claim by any Person to the effect that such Person is entitled to acquire or receive any shares of capital stock or other securities of the Company or any of its Subsidiaries. There are no outstanding or authorized stock appreciation, phantom stock, profit participation or other similar rights with respect to the Company or any of its Subsidiaries.

(e) All outstanding shares of Company Common Stock, Company Preferred Stock, Company Options and other securities of the Company have been issued and granted in material compliance with (i) all applicable securities laws and other applicable Law, and (ii) all requirements set forth in applicable Contracts.

2.7 Financial Statements.

(a) Section 2.7(a) of the Company Disclosure Schedule includes true and complete copies of (i) the Company's audited consolidated financial statements which comprise the consolidated balance sheets at December 31, 2015 and 2014, and the related consolidated statements of operations, equity, and cash flows for the year ended December 31, 2015 and the period from March 24, 2014 (inception) to December 31, 2014, and the related notes to the consolidated financial statements, (ii) the Company's unaudited consolidated financial statements which comprise the consolidated balance sheets at December 31, 2016, and the related consolidated statements of operations, equity, and cash flows for the year then ended, and the related notes to the consolidated financial statements, (iii) the Company's unaudited consolidated interim balance sheet as of March 31, 2017, and (iv) the Company's unaudited consolidated statements of operations, and cash flows for the three months ended March 31, 2017 (collectively, the "***Company Financials***"). The Company Financials (A) were prepared in accordance with United States generally accepted accounting principles ("***GAAP***") (except as may be indicated

in the footnotes to such Company Financials and that unaudited financial statements may not have notes thereto and other presentation items that may be required by GAAP and are subject to normal and recurring year-end adjustments that are not reasonably expected to be material in amount) applied on a consistent basis unless otherwise noted therein throughout the periods indicated and (B) fairly present, in all material respects, the financial position and operating results of the Company and its consolidated Subsidiaries as of the dates and for the periods indicated therein.

(b) Each of the Company and its Subsidiaries maintains a system of internal accounting controls designed to provide reasonable assurance that: (i) transactions are executed in accordance with management's general or specific authorizations; (ii) transactions are recorded as necessary to permit preparation of the financial statements of the Company and its Subsidiaries in conformity with GAAP and to maintain accountability of the Company's and its Subsidiaries' assets; (iii) access to the Company's and its Subsidiaries' assets is permitted only in accordance with management's general or specific authorization; and (iv) the recorded accountability for the Company's and its Subsidiaries' assets is compared with the existing assets at regular intervals and appropriate action is taken with respect to any differences. The Company and each of its Subsidiaries maintains internal control over financial reporting that provides reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP.

(c) Section 2.7(c) of the Company Disclosure Schedule lists, and the Company has delivered to Meerkat accurate and complete copies of the documentation creating or governing, all securitization transactions and "off-balance sheet arrangements" (as defined in Item 303(c) of Regulation S-K under the Exchange Act) effected by the Company or any of its Subsidiaries since January 1, 2015.

(d) Since January 1, 2015, there have been no formal internal investigations regarding financial reporting or accounting policies and practices discussed with, reviewed by or initiated at the direction of the chief executive officer, chief financial officer or general counsel of the Company, the Company Board or any committee thereof. Since January 1, 2015, neither the Company nor its independent auditors have identified (i) any significant deficiency or material weakness in the design or operation of the system of internal accounting controls utilized by the Company and its Subsidiaries, (ii) any fraud, whether or not material, that involves the Company, any of its Subsidiaries, the Company's management or other employees who have a role in the preparation of financial statements or the internal accounting controls utilized by the Company and its Subsidiaries or (iii) any claim or allegation regarding any of the foregoing.

2.8 Absence of Changes. Except as set forth on Section 2.8 of the Company Disclosure Schedule, between December 31, 2016 and the date of this Agreement, the Company has conducted its business only in the Ordinary Course of Business (except for the execution and performance of this Agreement and the discussions, negotiations and transactions related thereto) and there has not been any (a) Company Material Adverse Effect or (b) action, event or occurrence that would have required consent of Meerkat pursuant to Section 4.2(b) of this Agreement had such action, event or occurrence taken place after the execution and delivery of this Agreement.

2.9 Absence of Undisclosed Liabilities. As of the date hereof, neither the Company nor any of its Subsidiaries has any liability, indebtedness, obligation, expense, claim, deficiency, guaranty or endorsement of any kind, whether accrued, absolute, contingent, matured, unmatured or other (whether or not required to be reflected in the financial statements in accordance with GAAP) (each a "***Liability***"), individually or in the aggregate, except for: (a) Liabilities identified as such in the "liabilities" column of the Company Unaudited Interim Balance Sheet; (b) normal and recurring current Liabilities that have been incurred by the Company or its Subsidiaries since the date of the Company Unaudited Interim Balance Sheet in the Ordinary Course of Business and which are not in excess of $500,000 in the aggregate; (c) Liabilities for performance of obligations of the Company or any of its Subsidiaries under Company Contracts; (d) Liabilities incurred in connection with the Contemplated Transactions; and (e) Liabilities listed in Section 2.9 of the Company Disclosure Schedule.

2.10 Title to Assets. Each of the Company and its Subsidiaries owns, and has good and valid title to, or, in the case of leased properties and assets, valid leasehold interests in, all tangible properties or assets and equipment used or held for use in its business or operations or purported to be owned by it, including: (a) all assets reflected on the Company Unaudited Interim Balance Sheet; and (b) all other assets reflected in the books and records of the Company or any of its Subsidiaries as being owned by the Company or such Subsidiary. All of such assets are owned or, in the case of leased assets, leased by the Company or any of its Subsidiaries free and clear of any Encumbrances, other than Permitted Encumbrances.

2.11 Real Property; Leasehold. Neither the Company nor any of its Subsidiaries owns or has ever owned any real property. The Company has made available to Meerkat (a) an accurate and complete list of all real properties with respect to which the Company directly or indirectly holds a valid leasehold interest as well as any other real estate that is in the possession of or leased by the Company or any of its Subsidiaries, and (b) copies of all leases under which any such real property is possessed (the "***Company Real Estate Leases***"), each of which is in full force and effect, with no existing material default thereunder.

2.12 Intellectual Property.

(a) The Company, directly or through any of its Subsidiaries, owns, or has the right to use, and has the right to bring actions for the infringement of, all Company IP Rights, except for any failure to own or have such right to use, or have the right to bring actions that would not reasonably be expected to have a Company Material Adverse Effect.

(b) Section 2.12(b) of the Company Disclosure Schedule is an accurate, true and complete listing of all Company Registered IP.

(c) Section 2.12(c) of the Company Disclosure Schedule accurately identifies (i) all Company IP Rights licensed to the Company or any of its Subsidiaries (other than (A) any non-customized software that (1) is so licensed solely in executable or object code form pursuant to a non-exclusive, internal use software license and other Intellectual Property associated with such software and (2) is not incorporated into, or material to the development, manufacturing, or distribution of, any of the Company's or any of its Subsidiaries' products or services, (B) any Intellectual Property licensed ancillary to the purchase or use of equipment, reagents or other materials, and (C) any confidential information provided under confidentiality agreements), (ii) the corresponding Company Contract pursuant to which such Company IP Rights are licensed to the Company or any of its Subsidiaries and (iii) whether the license or licenses granted to the Company or any of its Subsidiaries are exclusive or non-exclusive.

(d) Section 2.12(d) of the Company Disclosure Schedule accurately identifies each Company Contract pursuant to which any Person has been granted any license under, or otherwise has received or acquired any right (whether or not currently exercisable) or interest in, any Company IP Rights (other than (i) any confidential information provided under confidentiality agreements and (ii) any Company IP Rights non-exclusively licensed to suppliers or service providers for the sole purpose of enabling such supplier or service providers to provide services for the Company's benefit).

(e) Neither the Company nor any of its Subsidiaries is bound by, and no Company IP Rights are subject to, any Contract containing any covenant or other provision that in any way limits or restricts the ability of the Company or any of its Subsidiaries to use, exploit, assert, or enforce any Company IP Rights anywhere in the world, in each case, in a manner that would materially limit the business of the Company as currently conducted.

(f) The Company or one of its Subsidiaries exclusively owns all right, title, and interest to and in Company IP Rights (other than (i) Company IP Rights exclusively and non-exclusively licensed to the Company or one of its Subsidiaries, as identified in Section 2.12(c) of the Company Disclosure Schedule, (ii) any non-customized software that (A) is licensed to the Company or any of its Subsidiaries solely in executable or object

code form pursuant to a non-exclusive, internal use software license and other Intellectual Property associated with such software and (B) is not incorporated into, or material to the development, manufacturing, or distribution of, any of the Company's or any of its Subsidiaries' products or services and (iii) any Intellectual Property licensed ancillary to the purchase or use of equipment, reagents or other materials), in each case, free and clear of any Encumbrances (other than Permitted Encumbrances). Without limiting the generality of the foregoing:

(i) All documents and instruments necessary to register or apply for or renew registration of Company Registered IP have been validly executed, delivered, and filed in a timely manner with the appropriate Governmental Body except for any such failure, individually or collectively, that would not reasonably be expected to have a Company Material Adverse Effect.

(ii) Each Person who is or was an employee or contractor of the Company or any of its Subsidiaries and who is or was involved in the creation or development of any Company IP Rights purported to be owned by the Company has signed a valid, enforceable agreement containing an assignment of such Intellectual Property to the Company or such Subsidiary and confidentiality provisions protecting trade secrets and confidential information of the Company and its Subsidiaries.

(iii) To the Knowledge of the Company, no current or former stockholder, officer, director, or employee of the Company or any of its Subsidiaries has any claim, right (whether or not currently exercisable), or interest to or in any Company IP Rights purported to be owned by the Company. To the Knowledge of the Company, no employee of the Company or any or any of its Subsidiaries is (a) bound by or otherwise subject to any Contract restricting him or her from performing his or her duties for the Company or such Subsidiary or (b) in breach of any Contract with any former employer or other Person concerning Company IP Rights purported to be owned by the Company or confidentiality provisions protecting trade secrets and confidential information comprising Company IP Rights purported to be owned by the Company.

(iv) No funding, facilities, or personnel of any Governmental Body were used, directly or indirectly, to develop or create, in whole or in part, any Company IP Rights in which the Company or any of its Subsidiaries has an ownership interest.

(v) The Company and each of its Subsidiaries has taken reasonable steps to maintain the confidentiality of and otherwise protect and enforce its rights in all proprietary information that the Company or such Subsidiary holds, or purports to hold, as a trade secret.

(vi) Neither the Company nor any of its Subsidiaries has assigned or otherwise transferred ownership of, or agreed to assign or otherwise transfer ownership of, any Company IP Rights to any other Person.

(vii) To the Knowledge of the Company, the Company IP Rights constitute all Intellectual Property necessary for the Company and its Subsidiaries to conduct its business as currently conducted.

(g) The Company has delivered or made available to Meerkat, a complete and accurate copy of all Company IP Rights Agreements. With respect to each of the Company IP Rights Agreements: (i) each such agreement is valid and binding on the Company or its Subsidiaries, as applicable, and in full force and effect; (ii) the Company has not received any written notice of termination or cancellation under such agreement, or received any written notice of breach or default under such agreement, which breach has not been cured or waived; and (iii) neither the Company nor its Subsidiaries, and to the Knowledge of the Company, no other party to any such agreement, is in breach or default thereof in any material respect.

(h) The manufacture, marketing, license, sale or intended use of any product or technology currently licensed or sold or under development by the Company or any of its Subsidiaries does not violate any license or

agreement between the Company or its Subsidiaries and any third party, and, to the Knowledge of the Company, does not infringe or misappropriate any Intellectual Property right of any other party, which infringement or misappropriation would reasonably be expected to have a Company Material Adverse Effect. To the Knowledge of the Company, no third party is infringing upon, or violating any license or agreement with the Company or its Subsidiaries relating to any Company IP Rights.

(i) There is no current or pending Legal Proceeding (including, but not limited to, opposition, interference or other proceeding in any patent or other government office) contesting the validity, ownership or right to use, sell, license or dispose of any Company IP Rights, nor has the Company or any of its Subsidiaries received any written notice asserting that any Company IP Rights or the proposed use, sale, license or disposition thereof conflicts with or infringes or misappropriates or will conflict with or infringe or misappropriate the rights of any other Person.

(j) Each item of Company IP Rights that is Company Registered IP is and at all times has been filed and maintained in compliance with all applicable Law and all filings, payments, and other actions required to be made or taken to maintain such item of Company Registered IP in full force and effect have been made by the applicable deadline, except for any failure to perform any of the foregoing, individually or collectively, that would not reasonably be expected to have a Company Material Adverse Effect.

(k) To the Knowledge of the Company, no trademark (whether registered or unregistered) or trade name owned, used, or applied for by the Company or any of its Subsidiaries conflicts or interferes with any trademark (whether registered or unregistered) or trade name owned, used, or applied for by any other Person. None of the goodwill associated with or inherent in any trademark (whether registered or unregistered) in which the Company or any of its Subsidiaries has or purports to have an ownership interest has been impaired as determined by the Company or any of its Subsidiaries in accordance with GAAP.

(l) Except as set forth in Sections 2.12(c) or 2.12(d) of the Company Disclosure Schedule (i) neither the Company nor any of its Subsidiaries is bound by any Contract to indemnify, defend, hold harmless, or reimburse any other Person with respect to any Intellectual Property infringement, misappropriation, or similar claim, and (ii) neither the Company nor any of its Subsidiaries has ever assumed, or agreed to discharge or otherwise take responsibility for, any existing or potential liability of another Person for infringement, misappropriation, or violation of any Intellectual Property right, which assumption, agreement or responsibility remains in force as of the date of this Agreement.

(m) Neither the Company nor any of its Subsidiaries is party to any Contract that, as a result of such execution, delivery and performance of this Agreement, will cause the grant of any license or other right to any Company IP Rights or impair the right of the Company or the Surviving Corporation and its Subsidiaries to use, sell or license or enforce any Company IP Rights or portion thereof, except for the occurrence of any such grant or impairment that would not individually or in the aggregate, reasonably be expected to result in a Company Material Adverse Effect.

2.13 Agreements, Contracts and Commitments.

(a) Section 2.13(a) of the Company Disclosure Schedule lists the following Company Contracts in effect as of the date of this Agreement (each, a "***Company Material Contract***" and collectively, the "***Company Material Contracts***"):

(i) each Company Contract relating to any material bonus, deferred compensation, severance, incentive compensation, pension, profit-sharing or retirement plans, or any other employee benefit plans or arrangements;

(ii) each Company Contract requiring payments by the Company after the date of this Agreement in excess of $150,000 pursuant to its express terms relating to the employment of, or the performance of

employment-related services by, any Person, including any employee, consultant or independent contractor, or entity providing employment related, consulting or independent contractor services, not terminable by the Company or its Subsidiaries on 90 calendar days' or less notice without liability, except to the extent general principles of wrongful termination law may limit the Company's, its Subsidiaries' or such successor's ability to terminate employees at will;

(iii) each Company Contract relating to any agreement or plan, including any stock option plan, stock appreciation right plan or stock purchase plan, any of the benefits of which will be increased, or the vesting of benefits of which will be accelerated, by the occurrence of any of the Contemplated Transactions (either alone or in conjunction with any other event, such as termination of employment), or the value of any of the benefits of which will be calculated on the basis of any of the Contemplated Transactions;

(iv) each Company Contract relating to any agreement of indemnification or guaranty not entered into in the Ordinary Course of Business;

(v) each Company Contract containing (A) any covenant limiting the freedom of the Company, its Subsidiaries or the Surviving Corporation to engage in any line of business or compete with any Person, (B) any most-favored pricing arrangement, (C) any exclusivity provision, or (D) any non-solicitation provision;

(vi) each Company Contract relating to capital expenditures and requiring payments after the date of this Agreement in excess of $250,000 pursuant to its express terms and not cancelable without penalty;

(vii) each Company Contract relating to the disposition or acquisition of material assets or any ownership interest in any Entity;

(viii) each Company Contract relating to any mortgages, indentures, loans, notes or credit agreements, security agreements or other agreements or instruments relating to the borrowing of money or extension of credit in excess of $250,000 or creating any material Encumbrances with respect to any assets of the Company or any of its Subsidiaries or any loans or debt obligations with officers or directors of the Company;

(ix) each Company Contract requiring payment by or to the Company after the date of this Agreement in excess of $250,000 pursuant to its express terms relating to: (A) any distribution agreement (identifying any that contain exclusivity provisions); (B) any agreement involving provision of services or products with respect to any pre-clinical or clinical development activities of the Company; (C) any dealer, distributor, joint marketing, alliance, joint venture, cooperation, development or other agreement currently in force under which the Company has continuing obligations to develop or market any product, technology or service, or any agreement pursuant to which the Company has continuing obligations to develop any Intellectual Property that will not be owned, in whole or in part, by the Company; or (D) any Contract to license any third party to manufacture or produce any product, service or technology of the Company or any Contract to sell, distribute or commercialize any products or service of the Company, in each case, except for Company Contracts entered into in the Ordinary Course of Business;

(x) each Company Contract with any Person, including any financial advisor, broker, finder, investment banker or other Person, providing advisory services to the Company in connection with the Contemplated Transactions;

(xi) each Company Real Estate Lease; or

(xii) any other Company Contract that is not terminable at will (with no penalty or payment) by the Company or its Subsidiaries, as applicable, and (A) which involves payment or receipt by the Company or its Subsidiaries after the date of this Agreement under any such agreement, contract or commitment of more than $250,000 in the aggregate, or obligations after the date of this Agreement in excess of $250,000 in the aggregate, or (B) that is material to the business or operations of the Company and its Subsidiaries, taken as a whole.

(b) The Company has delivered or made available to Meerkat accurate and complete copies of all Company Material Contracts, including all amendments thereto. There are no Company Material Contracts that are not in written form. Neither the Company nor any of its Subsidiaries has, nor to the Company's Knowledge, as of the date of this Agreement has any other party to a Company Material Contract, breached, violated or defaulted under, or received notice that it breached, violated or defaulted under, any of the terms or conditions of any Company Material Contract in such manner as would permit any other party to cancel or terminate any such Company Material Contract, or would permit any other party to seek damages which would reasonably be expected to have a Company Material Adverse Effect. As to the Company and its Subsidiaries, as of the date of this Agreement, each Company Material Contract is valid, binding, enforceable and in full force and effect, subject to the Enforceability Exceptions. No Person is renegotiating, or has a right pursuant to the terms of any Company Material Contract to change, any material amount paid or payable to the Company under any Company Material Contract or any other material term or provision of any Company Material Contract.

2.14 Compliance; Permits; Restrictions.

(a) The Company and each of its Subsidiaries are, and since January 1, 2014 have been, in compliance in all material respects with all applicable Laws. No investigation, claim, suit, proceeding, audit or other action by any Governmental Body is pending or, to the Knowledge of the Company, threatened against the Company or any of its Subsidiaries. There is no agreement, judgment, injunction, order or decree binding upon the Company or any of its Subsidiaries which (i) has or would reasonably be expected to have the effect of prohibiting or materially impairing any business practice of the Company or any of its Subsidiaries, any acquisition of material property by the Company or any of its Subsidiaries or the conduct of business by the Company or any of its Subsidiaries as currently conducted, (ii) is reasonably likely to have an adverse effect on the Company's ability to comply with or perform any covenant or obligation under this Agreement, or (iii) is reasonably likely to have the effect of preventing, delaying, making illegal or otherwise interfering with the Contemplated Transactions.

(b) The Company and its Subsidiaries hold all required Governmental Authorizations which are material to the operation of the business of the Company and its Subsidiaries as currently conducted (the "***Company Permits***"). Section 2.14(b) of the Company Disclosure Schedule identifies each Company Permit. Each of the Company and its Subsidiaries is in material compliance with the terms of the Company Permits. No Legal Proceeding is pending or, to the Knowledge of the Company, threatened, which seeks to revoke, limit, suspend, or materially modify any Company Permit. The rights and benefits of each Company Permit will be available to the Surviving Corporation or its Subsidiaries, as applicable, immediately after the Effective Time on terms substantially identical to those enjoyed by the Company and its Subsidiaries as of the date of this Agreement and immediately prior to the Effective Time.

(c) There are no proceedings pending or, to the Knowledge of the Company, threatened with respect to an alleged material violation by the Company or any of its Subsidiaries of the Federal Food, Drug, and Cosmetic Act ("***FDCA***"), Food and Drug Administration ("***FDA***") regulations adopted thereunder, the Controlled Substance Act or any other similar Laws or regulations promulgated or enforced by the FDA or other comparable Governmental Body responsible for regulation of the development, clinical testing, manufacturing, sale, marketing, distribution and importation or exportation of drug products ("***Drug Regulatory Agency***").

(d) The Company and each of its Subsidiaries holds all required Governmental Authorizations issuable by any Drug Regulatory Agency necessary for the conduct of the business of the Company or such Subsidiary as currently conducted, and the development, clinical testing, manufacturing, marketing, distribution and importation or exportation, as currently conducted, of any of its products or product candidates (the "***Company Product Candidates***") (collectively, the "***Company Regulatory Permits***") and no such Company Regulatory Permit has been (i) revoked, withdrawn, suspended, cancelled or terminated or (ii) modified in any adverse manner, other than immaterial adverse modifications. The Company and each of its Subsidiaries are in compliance in all material respects with the Company Regulatory Permits and have not received any written notice or other written communication from any Drug Regulatory Agency regarding (A) any material violation of

or failure to comply materially with any term or requirement of any Company Regulatory Permit or (B) any revocation, withdrawal, suspension, cancellation, termination or material modification of any Company Regulatory Permit. Except for the information and files identified in Section 2.14(d) of the Company Disclosure Schedule, the Company has made available to Meerkat all information requested by Meerkat in the Company's or its Subsidiaries' possession or control relating to the Company Product Candidates and the development, clinical testing, manufacturing, importation and exportation of the Company Product Candidates, including complete copies of the following (to the extent there are any): (x) adverse event reports; clinical study reports and material study data; inspection reports, notices of adverse findings, warning letters, filings and letters and other written correspondence to and from any Drug Regulatory Agency; and meeting minutes with any Drug Regulatory Agency; and (y) similar reports, material study data, notices, letters, filings, correspondence and meeting minutes with any other Governmental Body.

(e) All clinical, pre-clinical and other studies and tests conducted by or, to the Knowledge of the Company, on behalf of or sponsored by the Company or its Subsidiaries, or in which the Company or its Subsidiaries or their respective current products or product candidates, including the Company Product Candidates, have participated, were and, if still pending, are being conducted in all material respects in accordance with standard medical and scientific research procedures and in compliance in all material respects with the applicable regulations of the Drug Regulatory Agencies and other applicable Law, including, without limitation, 21 C.F.R. Parts 50, 54, 56, 58 and 312. Since January 1, 2014, neither the Company nor any of its Subsidiaries has received any notices, correspondence, or other communications from any Drug Regulatory Agency requiring, or to the Knowledge of the Company threatening to initiate, the termination or suspension of any clinical trials conducted by or on behalf of, or sponsored by, the Company or any of its Subsidiaries or in which the Company or any of its Subsidiaries or their respective current products or product candidates, including the Company Product Candidates, have participated.

(f) Neither the Company nor any of its Subsidiaries is the subject of any pending or, to the Knowledge of the Company, threatened investigation in respect of its business or products by the FDA pursuant to its "Fraud, Untrue Statements of Material Facts, Bribery, and Illegal Gratuities" Final Policy set forth in 56 Fed. Reg. 46191 (September 10, 1991) and any amendments thereto. To the Knowledge of the Company, neither the Company nor any of its Subsidiaries has committed any acts, made any statement, or failed to make any statement, in each case in respect of its business or products that would violate the FDA's "Fraud, Untrue Statements of Material Facts, Bribery, and Illegal Gratuities" Final Policy, and any amendments thereto. None of the Company, any of its Subsidiaries or any of their respective officers, employees or agents has been convicted of any crime or engaged in any conduct that could result in a debarment or exclusion (i) under 21 U.S.C. Section 335a or (ii) any similar applicable Law. To the Knowledge of the Company, no debarment or exclusionary claims, actions, proceedings or investigations in respect of their business or products are pending or threatened against the Company, any of its Subsidiaries or any of their respective officers, employees or agents.

2.15 Legal Proceedings; Orders.

(a) Except as set forth in Section 2.15(a) of the Company Disclosure Schedule, there is no pending Legal Proceeding and, to the Knowledge of the Company, no Person has threatened in writing to commence any Legal Proceeding: (i) that involves the Company or any of its Subsidiaries, any Company Associate (in his or her capacity as such) or any of the material assets owned or used by the Company or its Subsidiaries; or (ii) that challenges, or that may have the effect of preventing, delaying, making illegal or otherwise interfering with, the Contemplated Transactions.

(b) There is no order, writ, injunction, judgment or decree to which the Company or any of its Subsidiaries, or any of the material assets owned or used by the Company or any of its Subsidiaries, is subject. To the Knowledge of the Company, no officer or other Key Employee of the Company or any of its Subsidiaries is subject to any order, writ, injunction, judgment or decree that prohibits such officer or employee from engaging in or continuing any conduct, activity or practice relating to the business of the Company or any of its Subsidiaries or to any material assets owned or used by the Company or any of its Subsidiaries.

2.16 Tax Matters.

(a) The Company and each of its Subsidiaries have timely filed all federal income Tax Returns and other material Tax Returns that they were required to file under applicable Law. All such Tax Returns were correct and complete in all material respects and have been prepared in material compliance with all applicable Law. Subject to exceptions as would not be material, no written claim has ever been made by an authority in a jurisdiction where the Company or any of its Subsidiaries does not file Tax Returns that it is subject to taxation by that jurisdiction.

(b) All material Taxes due and owing by the Company or any of its Subsidiaries on or before the date hereof (whether or not shown on any Tax Return) have been paid. Since the date of the Company Unaudited Interim Balance Sheet, neither the Company nor any of its Subsidiaries has incurred any material Liability for Taxes outside the Ordinary Course of Business or otherwise inconsistent with past custom and practice.

(c) The Company and each of its Subsidiaries have withheld and paid all material Taxes required to have been withheld and paid in connection with any amounts paid or owing to any employee, independent contractor, creditor, stockholder, or other third party.

(d) There are no Encumbrances for material Taxes (other than Taxes not yet due and payable) upon any of the assets of the Company or any of its Subsidiaries.

(e) No deficiencies for material Taxes with respect to the Company or any of its Subsidiaries have been claimed, proposed or assessed by any Governmental Body in writing. There are no pending (or, based on written notice, threatened) material audits, assessments or other actions for or relating to any liability in respect of Taxes of the Company or any of its Subsidiaries. Neither the Company nor any of its Subsidiaries (or any of their predecessors) has waived any statute of limitations in respect of material Taxes or agreed to any extension of time with respect to a material Tax assessment or deficiency.

(f) Neither the Company nor any of its Subsidiaries has been a United States real property holding corporation within the meaning of Section 897(c)(2) of the Code during the applicable period specified in Section 897(c)(1)(A)(ii) of the Code.

(g) Neither the Company nor any of its Subsidiaries is a party to any material Tax allocation, Tax sharing or similar agreement (including indemnity arrangements), other than commercial contracts entered into in the Ordinary Course of Business with vendors, customers and landlords.

(h) Neither the Company nor any of its Subsidiaries has ever been a member of an affiliated group filing a consolidated U.S. federal income Tax Return (other than a group the common parent of which is the Company). Neither the Company nor any of its Subsidiaries has any material Liability for the Taxes of any Person (other than the Company and any of its Subsidiaries) under Treasury Regulations Section 1.1502-6 (or any similar provision of state, local, or foreign law) or as a transferee or successor.

(i) Neither the Company nor any of its Subsidiaries has distributed stock of another Person, or has had its stock distributed by another Person, in a transaction that was purported or intended to be governed in whole or in part by Section 355 of the Code or Section 361 of the Code in the last two years.

(j) Neither the Company nor any of its Subsidiaries has entered into any transaction identified as a “reportable transaction” for purposes of Treasury Regulations Section 1.6011-4(b).

2.17 Employee and Labor Matters; Benefit Plans.

(a) The employment of each of the Company’s and any of its Subsidiaries’ employees is terminable by the Company or the applicable Subsidiary at will (or, in respect of any jurisdiction outside the United States,

otherwise in accordance with general principles of wrongful termination law). The Company has made available to Meerkat accurate and complete copies of all employee manuals and handbooks, disclosure materials, policy statements and other materials relating to the employment of Company Associates to the extent currently effective and material.

(b) Neither the Company nor any of its Subsidiaries is a party to, bound by, or has a duty to bargain under, any collective bargaining agreement or other Contract with a labor organization representing any of its employees, and there are no labor organizations representing or, to the Knowledge of the Company, purporting to represent or seeking to represent any employees of the Company or its Subsidiaries.

(c) Section 2.17(c) of the Company Disclosure Schedule lists all written and describes all non-written employee benefit plans (as defined in Section 3(3) of ERISA) and all bonus, equity-based, incentive, deferred compensation, retirement or supplemental retirement, profit sharing, severance, golden parachute, vacation, cafeteria, dependent care, medical care, employee assistance program, education or tuition assistance programs and other similar material fringe or employee benefit plans, programs or arrangements, including any employment or executive compensation or severance agreements, written or otherwise, which are currently in effect relating to any present or former employee or director of the Company or any of its Subsidiaries (or any trade or business (whether or not incorporated) which is a Company Affiliate) or which is maintained by, administered or contributed to by, or required to be contributed to by, the Company, any of its Subsidiaries or any Company Affiliate, or under which the Company or any of its Subsidiaries or any Company Affiliate has any current liability or may incur liability after the date hereof (each, a "***Company Employee Plan***").

(d) With respect to Company Options granted pursuant to the Company Plan, (i) each Company Option intended to qualify as an "incentive stock option" under Section 422 of the Code so qualifies, (ii) each grant of a Company Option was duly authorized no later than the date on which the grant of such Company Option was by its terms to be effective (the "***Grant Date***") by all necessary corporate action, including, as applicable, approval by the Company Board (or a duly constituted and authorized committee thereof) and any required stockholder approval by the necessary number of votes or written consents, and the award agreement governing such grant (if any) was duly executed and delivered by each party thereto, (iii) each Company Option grant was made in accordance with the terms of the Company Plan and all other applicable Law and (iv) the per share exercise price of each Company Option was not less than the fair market value of a share of Company Common Stock on the applicable Grant Date.

(e) Each Company Employee Plan that is intended to be qualified under Section 401(a) of the Code has received a favorable determination or opinion letter with respect to such qualified status from the IRS. To the Knowledge of the Company, nothing has occurred that would reasonably be expected to adversely affect the qualified status of any such Company Employee Plan or the exempt status of any related trust.

(f) Each Company Employee Plan has been maintained in compliance, in all material respects, with its terms and, both as to form and operation, with all applicable Law, including the Code and ERISA.

(g) Neither the Company nor any of its Subsidiaries has engaged in any transaction in violation of Sections 404 or 406 of ERISA or any "prohibited transaction," as defined in Section 4975(c)(1) of the Code, for which no exemption exists under Section 408 of ERISA or Section 4975(c)(2) or (d) of the Code, or has otherwise violated the provisions of Part 4 of Title I, Subtitle B of ERISA. Neither the Company nor any of its Subsidiaries has knowingly participated in a violation of Part 4 of Title I, Subtitle B of ERISA by any plan fiduciary of any Company Employee Plan subject to ERISA and neither the Company nor any of its Subsidiaries has been assessed any civil penalty under Section 502(l) of ERISA.

(h) No Company Employee Plan is subject to Title IV or Section 302 of ERISA or Section 412 of the Code, and neither the Company nor any of its ERISA Affiliates has ever maintained, contributed to or partially or completely withdrawn from, or incurred any obligation or liability with respect to, any such plan. No Company

Employee Plan is a Multiemployer Plan, and neither the Company nor any of its ERISA Affiliates has ever contributed to or had an obligation to contribute, or incurred any liability in respect of a contribution, to any Multiemployer Plan. No Company Employee Plan is a Multiple Employer Plan. No Company Employee Plan is a Multiple Employer Welfare Arrangement. Neither the Company nor any of its ERISA Affiliates sponsors or maintains any self-funded welfare employee benefit plan.

(i) No Company Employee Plan provides for medical or death benefits beyond termination of service or retirement, other than (i) pursuant to COBRA or an analogous state law requirement or (ii) death or retirement benefits under a Company Employee Plan qualified under Section 401(a) of the Code. No Company Plan is subject to any Law of a foreign jurisdiction outside of the United States.

(j) Neither the Company nor any of its Subsidiaries is a party to any Contract that has resulted or would reasonably be expected to result, separately or in the aggregate, in the payment of (i) any "excess parachute payment" within the meaning of Section 280G of the Code or (ii) any amount the deduction for which would be disallowed under Section 162(m) of the Code.

(k) To the Knowledge of the Company, no Company Options or other equity-based awards issued or granted by the Company are subject to the requirements of Code Section 409A. To the Knowledge of the Company, each "nonqualified deferred compensation plan" (as such term is defined under Section 409A(d)(1) of the Code and the guidance thereunder) (each, a "***409A Plan***") under which the Company makes, is obligated to make or promises to make, payments, complies in all material respects, in both form and operation, with the requirements of Code Section 409A and the guidance thereunder. No payment to be made under any 409A Plan is, or to the Knowledge of the Company will be, subject to the penalties of Code Section 409A(a)(1).

(l) The Company and each of its Subsidiaries is in material compliance with all of its bonus, commission and other compensation plans and has paid any and all amounts required to be paid under such plans, including any and all bonuses and commissions (or pro rata portion thereof) that may have accrued or been earned through the calendar quarter preceding the Effective Time, and is not liable for any material payments, taxes or penalties for failure to comply with any of the terms or conditions of such plans or the laws governing such plans.

(m) The Company and each of its Subsidiaries is in material compliance with all applicable foreign, federal, state and local laws, rules and regulations respecting employment, employment practices, terms and conditions of employment, worker classification, tax withholding, prohibited discrimination, equal employment, fair employment practices, meal and rest periods, immigration status, employee safety and health, wages (including overtime wages), compensation, and hours of work, and in each case, with respect to the employees of the Company and its Subsidiaries: (i) has withheld and reported all material amounts required by law or by agreement to be withheld and reported with respect to wages, salaries and other payments to employees, (ii) is not liable for any arrears of wages, severance pay or any Taxes or any penalty for failure to comply with any of the foregoing, and (iii) is not liable for any material payment to any trust or other fund governed by or maintained by or on behalf of any governmental authority, with respect to unemployment compensation benefits, social security or other benefits or obligations for employees (other than routine payments to be made in the Ordinary Course of Business). To the Knowledge of the Company, there are no pending or threatened or reasonably anticipated claims or actions against the Company, any of its Subsidiaries, any Company trustee or any trustee of any Subsidiary under any workers' compensation policy or long-term disability policy. Neither the Company nor any Subsidiary thereof is a party to a conciliation agreement, consent decree or other agreement or order with any federal, state, or local agency or governmental authority with respect to employment practices.

(n) Section 2.17(n) of the Company Disclosure Schedule lists all liabilities of the Company or any of its Subsidiaries to any employee that result from the termination by the Company or any of its Subsidiaries of such employee's employment or provision of services, a change of control of the Company, or a combination thereof. Neither the Company nor any of its Subsidiaries has any material liability with respect to any

misclassification of: (a) any Person as an independent contractor rather than as an employee, (b) any employee leased from another employer, or (c) any employee currently or formerly classified as exempt from overtime wages. Neither the Company nor any Subsidiary has taken any action which would constitute a "plant closing" or "mass layoff" within the meaning of the WARN Act or similar state or local law, issued any notification of a plant closing or mass layoff required by the WARN Act or similar state or local law, or incurred any liability or obligation under WARN or any similar state or local law that remains unsatisfied. No terminations of employees of the Company or any of its Subsidiaries prior to the Closing would trigger any notice or other obligations under the WARN Act or similar state or local law.

(o) With respect to each Company Employee Plan, the Company has made available to Meerkat a true and complete copy of, to the extent applicable, (i) such Company Employee Plan, (ii) the three most recent annual reports (Form 5500) as filed with the IRS, (iii) each currently effective trust agreement related to such Company Employee Plan, (iv) the most recent summary plan description for each Company Employee Plan for which such description is required, along with all summaries of material modifications, amendments, resolutions and all other material plan documentation related thereto in the possession of the Company, and (v) the most recent IRS determination or opinion letter or analogous ruling under foreign law issued with respect to any Company Employee Plan.

(p) There has never been, nor has there been any threat of, any strike, slowdown, work stoppage, lockout, job action, union, organizing activity, question concerning representation or any similar activity or dispute, affecting the Company or any of its Subsidiaries. No event has occurred, and no condition or circumstance exists, that might directly or indirectly be likely to give rise to or provide a basis for the commencement of any such strike, slowdown, work stoppage, lockout, job action, union organizing activity, question concerning representation or any similar activity or dispute.

(q) Neither the Company nor any of its Subsidiaries is, nor has the Company or any of its Subsidiaries been, engaged in any unfair labor practice within the meaning of the National Labor Relations Act. There is no Legal Proceeding, claim, labor dispute or grievance pending or, to the Knowledge of the Company, threatened or reasonably anticipated relating to any employment contract, privacy right, labor dispute, wages and hours, leave of absence, plant closing notification, workers' compensation policy, long-term disability policy, harassment, retaliation, immigration, employment statute or regulation, safety or discrimination matter involving any Company Associate, including charges of unfair labor practices or discrimination complaints. There are no actions, suits, claims or administrative matters pending or, to the Knowledge of the Company, threatened or reasonably anticipated against the Company or any of its Subsidiaries relating to any employee, employment agreement or Company Employee Plan (other than routine claims for benefits).

(r) There is no contract, agreement, plan or arrangement to which the Company or any Company Affiliate is a party or by which it is bound to compensate any of its employees for excise taxes paid pursuant to Section 4999 of the Code.

2.18 Environmental Matters. Since January 1, 2014, the Company and each of its Subsidiaries has complied with all applicable Environmental Laws, which compliance includes the possession by the Company of all permits and other Governmental Authorizations required under applicable Environmental Laws and compliance with the terms and conditions thereof, except for any failure to be in compliance that, individually or in the aggregate, would not result in a Company Material Adverse Effect. Neither the Company nor any of its Subsidiaries has received since January 1, 2014, any written notice or other communication (in writing or otherwise), whether from a Governmental Body, citizens group, employee or otherwise, that alleges that the Company or any of its Subsidiaries is not in compliance with any Environmental Law, and, to the Knowledge of the Company, there are no circumstances that may prevent or interfere with the Company's or any of its Subsidiaries' compliance with any Environmental Law in the future, except where such failure to comply would not reasonably be expected to have a Company Material Adverse Effect. To the Knowledge of the Company: (i) no current or prior owner of any property leased or controlled by the Company or any of its

Subsidiaries has received since January 1, 2014, any written notice or other communication relating to property owned or leased at any time by the Company or any of its Subsidiaries, whether from a Governmental Body, citizens group, employee or otherwise, that alleges that such current or prior owner or the Company or any of its Subsidiaries is not in compliance with or violated any Environmental Law relating to such property and (ii) neither the Company nor any of its Subsidiaries has any material liability under any Environmental Law.

2.19 Insurance. The Company has made available to Meerkat accurate and complete copies of all material insurance policies and all material self-insurance programs and arrangements relating to the business, assets, liabilities and operations of the Company and each of its Subsidiaries. Each of such insurance policies is in full force and effect and the Company and each of its Subsidiaries are in compliance in all material respects with the terms thereof. Other than customary end of policy notifications from insurance carriers, since January 1, 2014, neither the Company nor any of its Subsidiaries has received any notice or other communication regarding any actual or possible: (i) cancellation or invalidation of any insurance policy; or (ii) refusal or denial of any coverage, reservation of rights or rejection of any material claim under any insurance policy. The Company and each of its Subsidiaries have provided timely written notice to the appropriate insurance carrier(s) of each Legal Proceeding pending against the Company or any of its Subsidiaries for which the Company or such Subsidiary has insurance coverage, and no such carrier has issued a denial of coverage or a reservation of rights with respect to any such Legal Proceeding, or informed the Company or any of its Subsidiaries of its intent to do so.

2.20 [Reserved].

2.21 No Financial Advisors. Except as set forth on Section 2.21 of the Company Disclosure Schedule, no broker, finder or investment banker is entitled to any brokerage fee, finder's fee, opinion fee, success fee, transaction fee or other fee or commission in connection with the Contemplated Transactions based upon arrangements made by or on behalf of the Company or any of its Subsidiaries.

2.22 Disclosure. The information supplied by the Company and each of its Subsidiaries for inclusion in the Proxy Statement (including any of the Company Financials) will not, as of the date of the Proxy Statement or as of the date such information is prepared or presented, (i) contain any statement that is inaccurate or misleading with respect to any material facts, or (ii) omit to state any material fact necessary in order to make such information, in light of the circumstances under which such information will be provided, not false or misleading.

2.23 Transactions with Affiliates. Section 2.23 of the Company Disclosure Letter describes any material transactions or relationships, since January 1, 2014, between, on one hand, the Company or any of its Subsidiaries and, on the other hand, any (a) executive officer or director of the Company or any of its Subsidiaries or any of such executive officer's or director's immediate family members, (b) owner of more than five percent (5%) of the voting power of the outstanding Company Capital Stock or (c) to the Knowledge of the Company, any "related person" (within the meaning of Item 404 of Regulation S-K under the Securities Act) of any such officer, director or owner (other than the Company or its Subsidiaries) in the case of each of (a), (b) or (c) that is of the type that would be required to be disclosed under Item 404 of Regulation S-K under the Securities Act.

2.24 No Other Representations or Warranties. The Company hereby acknowledges and agrees that, except for the representations and warranties contained in this Agreement, neither Meerkat nor any other person on behalf of Meerkat makes any express or implied representation or warranty with respect to Meerkat or with respect to any other information provided to the Company, any of its Subsidiaries or stockholders or any of their respective Affiliates in connection with the transactions contemplated hereby, and (subject to the express representations and warranties of Meerkat set forth in Section 3 (in each case as qualified and limited by the Meerkat Disclosure Schedule)) none of the Company, its Subsidiaries or any of their respective Representatives or stockholders, has relied on any such information (including the accuracy or completeness thereof).

Section 3 Representations and Warranties of Meerkat and Merger Sub

Subject to Section 10.13(h), except (i) as set forth in the written disclosure schedule delivered by Meerkat to the Company (the "***Meerkat Disclosure Schedule***") or (ii) as disclosed in the Meerkat SEC Documents filed with the SEC prior to the date hereof and publicly available on the SEC's Electronic Data Gathering Analysis and Retrieval system (but (A) without giving effect to any amendment thereof filed with, or furnished to the SEC on or after the date hereof and (B) excluding any disclosures contained under the heading "Risk Factors" and any disclosure of risks included in any "forward-looking statements" disclaimer or in any other section to the extent they are forward-looking statements or cautionary, predictive or forward-looking in nature), Meerkat and Merger Sub represent and warrant to the Company as follows:

3.1 Due Organization; Subsidiaries; Etc.

(a) Each of Meerkat and Merger Sub is a corporation duly incorporated, validly existing and in good standing under the laws of the State of Delaware and has all necessary corporate power and authority: (i) to conduct its business in the manner in which its business is currently being conducted; (ii) to own or lease and use its property and assets in the manner in which its property and assets are currently owned or leased and used; and (iii) to perform its obligations under all Contracts by which it is bound. Since the date of its incorporation, Merger Sub has not engaged in any activities other than in connection with or as contemplated by this Agreement.

(b) Meerkat is licensed and qualified to do business, and is in good standing (to the extent applicable in such jurisdiction), under the laws of all jurisdictions where the nature of its business requires such licensing or qualification other than in jurisdictions where the failure to be so qualified individually or in the aggregate would not be reasonably expected to have a Meerkat Material Adverse Effect.

(c) Meerkat has no Subsidiaries except for Merger Sub and Meerkat does not own any capital stock of, or any equity ownership or profit sharing interest of any nature in, or control directly or indirectly, any other Entity other than Merger Sub. Meerkat is not and has not otherwise been, directly or indirectly, a party to, member of or participant in any partnership, joint venture or similar business entity. Meerkat has not agreed and is not obligated to make, nor is Meerkat bound by any Contract under which it may become obligated to make, any future investment in or capital contribution to any other Entity. Meerkat has not, at any time, been a general partner of, and has not otherwise been liable for any of the debts or other obligations of, any general partnership, limited partnership or other Entity.

3.2 Organizational Documents. Meerkat has delivered to the Company accurate and complete copies of Meerkat's Organizational Documents. Meerkat is not in breach or violation of its Organizational Documents in any material respect.

3.3 Authority; Binding Nature of Agreement. Each of Meerkat and Merger Sub has all necessary corporate power and authority to enter into and to perform its obligations under this Agreement and to consummate the Contemplated Transactions. The Meerkat Board (at meetings duly called and held) has: (a) determined that the Contemplated Transactions are fair to, advisable and in the best interests of Meerkat and its stockholders; (b) approved and declared advisable this Agreement and the Contemplated Transactions, including the issuance of shares of Meerkat Common Stock to the stockholders of the Company pursuant to the terms of this Agreement; and (c) determined to recommend, upon the terms and subject to the conditions set forth in this Agreement, that the stockholders of Meerkat vote to approve this Agreement and the Contemplated Transactions, including the issuance of shares of Meerkat Common Stock to the stockholders of the Company pursuant to the terms of this Agreement. The Merger Sub Board (by unanimous written consent) has: (x) determined that the Contemplated Transactions are fair to, advisable, and in the best interests of Merger Sub and its sole stockholder; (y) deemed advisable and approved this Agreement and the Contemplated Transactions; and (z) determined to recommend, upon the terms and subject to the conditions set forth in this Agreement, that the stockholder of Merger Sub vote to adopt this Agreement and thereby approve the Contemplated Transactions. This Agreement has been duly executed and delivered by Meerkat and Merger Sub and, assuming the due

authorization, execution and delivery by the Company, constitutes the legal, valid and binding obligation of Meerkat and Merger Sub, enforceable against each of Meerkat and Merger Sub in accordance with its terms, subject to the Enforceability Exceptions. Prior to the execution of the Meerkat Stockholder Support Agreements, the Meerkat Board approved the Meerkat Stockholder Support Agreements and the transactions contemplated thereby.

3.4 Vote Required. The affirmative vote of the holders of a majority of the shares of Meerkat Common Stock entitled to vote thereon (the "***Required Meerkat Stockholder Vote***") is the only vote of the holders of any class or series of Meerkat's capital stock necessary to approve the Meerkat Stockholder Matters.

3.5 Non-Contravention; Consents. Subject to compliance with the HSR Act and any foreign antitrust Law, obtaining the Required Meerkat Stockholder Vote and the filing of the Certificate of Merger required by the DGCL, neither (x) the execution, delivery or performance of this Agreement by Meerkat or Merger Sub, nor (y) the consummation of the Contemplated Transactions, will directly or indirectly (with or without notice or lapse of time):

(a) contravene, conflict with or result in a violation of any of the provisions of the Organizational Documents of Meerkat or Merger Sub;

(b) contravene, conflict with or result in a material violation of, or give any Governmental Body or other Person the right to challenge the Contemplated Transactions or to exercise any remedy or obtain any relief under, any Law or any order, writ, injunction, judgment or decree to which Meerkat or any of the assets owned or used by Meerkat, is subject;

(c) contravene, conflict with or result in a material violation of any of the terms or requirements of, or give any Governmental Body the right to revoke, withdraw, suspend, cancel, terminate or modify, any Governmental Authorization that is held by Meerkat or that otherwise relates to the business of Meerkat, or any of the assets owned, leased or used by Meerkat;

(d) contravene, conflict with or result in a violation or breach of, or result in a default under, any provision of any Meerkat Material Contract, or give any Person the right to: (i) declare a default or exercise any remedy under any Meerkat Material Contract; (ii) any material payment, rebate, chargeback, penalty or change in delivery schedule under any such Meerkat Material Contract; (iii) accelerate the maturity or performance of any Meerkat Material Contract; or (iv) cancel, terminate or modify any term of any Meerkat Material Contract, except in the case of any non-material breach, default, penalty or modification; or

(e) result in the imposition or creation of any Encumbrance upon or with respect to any asset owned or used by Meerkat (except for Permitted Encumbrances).

Except for (i) any Consent set forth on Section 3.5 of the Meerkat Disclosure Schedule under any Meerkat Contract, (ii) the Required Meerkat Stockholder Vote, (iii) the filing of the Certificate of Merger with the Secretary of State of the State of Delaware pursuant to the DGCL, (iv) any required filings under the HSR Act and any foreign antitrust Law and (v) such consents, waivers, approvals, orders, authorizations, registrations, declarations and filings as may be required under applicable federal and state securities laws, Meerkat was not, is not, and will not be required to make any filing with or give any notice to, or to obtain any Consent from, any Person in connection with (x) the execution, delivery or performance of this Agreement, or (y) the consummation of the Contemplated Transactions. The Meerkat Board and the Merger Sub Board have taken and will take all actions necessary to ensure that the restrictions applicable to business combinations contained in Section 203 of the DGCL are, and will be, inapplicable to the execution, delivery and performance of this Agreement and the Meerkat Stockholder Support Agreements and to the consummation of the Contemplated Transactions. No other state takeover statute or similar Law applies or purports to apply to the Merger, this Agreement, the Meerkat Stockholder Support Agreements or any of the Contemplated Transactions.

3.6 Capitalization, Etc.

(a) The authorized capital stock of Meerkat consists of (i) 255,000,000 shares of Meerkat Common Stock, par value $0.001 per share, of which 20,856,693 shares have been issued and are outstanding as of May 15, 2017 (the "***Capitalization Date***") and (ii) 5,000,000 shares of Preferred Stock, par value $0.001 per share, of which no shares have been issued and are outstanding as of the Capitalization Date. Meerkat does not hold any shares of its capital stock in its treasury.

(b) All of the outstanding shares of Meerkat Common Stock have been duly authorized and validly issued, and are fully paid and nonassessable and are free of any Encumbrances. None of the outstanding shares of Meerkat Common Stock is entitled or subject to any preemptive right, right of participation, right of maintenance or any similar right. None of the outstanding shares of Meerkat Common Stock is subject to any right of first refusal in favor of Meerkat. Except as contemplated herein, there is no Meerkat Contract relating to the voting or registration of, or restricting any Person from purchasing, selling, pledging or otherwise disposing of (or granting any option or similar right with respect to), any shares of Meerkat Common Stock. Meerkat is not under any obligation, nor is Meerkat bound by any Contract pursuant to which it may become obligated, to repurchase, redeem or otherwise acquire any outstanding shares of Meerkat Common Stock or other securities. Section 3.6(b) of the Meerkat Disclosure Schedule accurately and completely describes all repurchase rights held by Meerkat with respect to shares of Meerkat Common Stock (including shares issued pursuant to the exercise of stock options) and specifies which of those repurchase rights are currently exercisable.

(c) Except for the Meerkat 2008 Long Term Incentive Plan and the Meerkat 2015 Equity Incentive Award Plan (collectively, the "***Meerkat Stock Plans***") and the Meerkat 2015 Employee Stock Purchase Plan (the "***Meerkat ESPP***"), and except as set forth on Section 3.6(c) of the Meerkat Disclosure Schedule, Meerkat does not have any stock option plan or any other plan, program, agreement or arrangement providing for any equity-based compensation for any Person. As of the date of this Agreement, Meerkat has reserved 3,623,867 shares of Meerkat Common Stock for issuance under the Meerkat Stock Plans, of which 130,675 shares have been issued and are currently outstanding, 1,606,616 shares have been reserved for issuance upon exercise of Meerkat Options granted under the Meerkat Stock Plans, and 1,886,576 shares remain available for future issuance pursuant to the Meerkat Stock Plans. As of the date of this Agreement, Meerkat has reserved 369,690 shares of Meerkat Common Stock for future issuance pursuant to the Meerkat ESPP. Section 3.6(c) of the Meerkat Disclosure Schedule sets forth the following information with respect to each Meerkat Option outstanding as of the date of this Agreement: (i) the name of the optionee; (ii) the number of shares of Meerkat Common Stock subject to such Meerkat Option at the time of grant; (iii) the number of shares of Meerkat Common Stock subject to such Meerkat Option as of the date of this Agreement; (iv) the exercise price of such Meerkat Option; (v) the date on which such Meerkat Option was granted; (vi) the applicable vesting schedule, including the number of vested and unvested shares as of the date of this Agreement; (vii) the date on which such Meerkat Option expires; and (viii) whether such Meerkat Option is an "incentive stock option" (as defined in the Code) or a non-qualified stock option. Meerkat has made available to the Company accurate and complete copies of equity incentive plans pursuant to which Meerkat has equity-based awards, the forms of all award agreements evidencing such equity-based awards and evidence of board and stockholder approval of the Meerkat Stock Plans and any amendments thereto. As of the date of this Agreement, no employee or other service provider of Meerkat is participating in the ESPP, and there are no ongoing offering periods under the Meerkat ESPP.

(d) Except for the outstanding Meerkat Options or as set forth on Section 3.6(d) of the Meerkat Disclosure Schedule, there is no: (i) outstanding subscription, option, call, warrant or right (whether or not currently exercisable) to acquire any shares of the capital stock or other securities of Meerkat; (ii) outstanding security, instrument or obligation that is or may become convertible into or exchangeable for any shares of the capital stock or other securities of Meerkat; (iii) stockholder rights plan (or similar plan commonly referred to as a "poison pill") or Contract under which Meerkat is or may become obligated to sell or otherwise issue any shares of its capital stock or any other securities; or (iv) condition or circumstance that may give rise to or provide a basis for the assertion of a claim by any Person to the effect that such Person is entitled to acquire or

receive any shares of capital stock or other securities of Meerkat. There are no outstanding or authorized stock appreciation, phantom stock, profit participation or other similar rights with respect to Meerkat.

(e) All outstanding shares of Meerkat Common Stock, Meerkat Options and other securities of Meerkat have been issued and granted in material compliance with (i) all applicable securities laws and other applicable Law, and (ii) all requirements set forth in applicable Contracts.

3.7 SEC Filings; Financial Statements.

(a) Meerkat has delivered to the Company accurate and complete copies of all registration statements, proxy statements, Certifications (as defined below) and other statements, reports, schedules, forms and other documents filed by Meerkat with the SEC since September 30, 2015 (the "***Meerkat SEC Documents***"), other than such documents that can be obtained on the SEC's website at www.sec.gov. Except as set forth on Section 3.7(a) of the Meerkat Disclosure Schedule, all material statements, reports, schedules, forms and other documents required to have been filed by Meerkat or its officers with the SEC have been so filed on a timely basis. As of the time it was filed with the SEC (or, if amended or superseded by a filing prior to the date of this Agreement, then on the date of such filing), each of the Meerkat SEC Documents complied in all material respects with the applicable requirements of the Securities Act or the Exchange Act (as the case may be) and as of the time they were filed, none of the Meerkat SEC Documents contained any untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading. The certifications and statements required by (i) Rule 13a-14 under the Exchange Act and (ii) 18 U.S.C. §1350 (Section 906 of the Sarbanes-Oxley Act) relating to the Meerkat SEC Documents (collectively, the "***Certifications***") are accurate and complete and comply as to form and content with all applicable Laws. As used in this Section 3.7, the term "file" and variations thereof shall be broadly construed to include any manner in which a document or information is furnished, supplied or otherwise made available to the SEC.

(b) The financial statements (including any related notes) contained or incorporated by reference in the Meerkat SEC Documents: (i) complied as to form in all material respects with the published rules and regulations of the SEC applicable thereto; (ii) were prepared in accordance with GAAP (except as may be indicated in the notes to such financial statements or, in the case of unaudited financial statements, as permitted by Form 10-Q of the SEC, and except that the unaudited financial statements may not contain footnotes and are subject to normal and recurring year-end adjustments that are not reasonably expected to be material in amount) applied on a consistent basis unless otherwise noted therein throughout the periods indicated; and (iii) fairly present, in all material respects, the financial position of Meerkat as of the respective dates thereof and the results of operations and cash flows of Meerkat for the periods covered thereby. Other than as expressly disclosed in the Meerkat SEC Documents filed prior to the date hereof, there has been no material change in Meerkat's accounting methods or principles that would be required to be disclosed in Meerkat's financial statements in accordance with GAAP. The books of account and other financial records of Meerkat and each of its Subsidiaries are true and complete in all material respects.

(c) Meerkat's auditor has at all times since the date of enactment of the Sarbanes-Oxley Act been: (i) a registered public accounting firm (as defined in Section 2(a)(12) of the Sarbanes-Oxley Act); (ii) to the Knowledge of Meerkat, "independent" with respect to Meerkat within the meaning of Regulation S-X under the Exchange Act; and (iii) to the Knowledge of Meerkat, in compliance with subsections (g) through (l) of Section 10A of the Exchange Act and the rules and regulations promulgated by the SEC and the Public Company Accounting Oversight Board thereunder.

(d) Meerkat has not received any comment letter from the SEC or the staff thereof or any correspondence from NASDAQ or the staff thereof relating to the delisting or maintenance of listing of the Meerkat Common Stock on the NASDAQ Global Market. Meerkat has not disclosed any unresolved comments in the Meerkat SEC Documents.

(e) Since January 1, 2014, there have been no formal internal investigations regarding financial reporting or accounting policies and practices discussed with, reviewed by or initiated at the direction of the chief executive officer, chief financial officer, or general counsel of Meerkat, the Meerkat Board or any committee thereof, other than ordinary course audits or reviews of accounting policies and practices or internal controls required by the Sarbanes-Oxley Act.

(f) Meerkat is in compliance in all material respects with the applicable provisions of the Sarbanes-Oxley Act and the applicable listing and governance rules and regulations of the NASDAQ Global Market.

(g) Meerkat maintains a system of internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) of the Exchange Act) that is sufficient to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP, including policies and procedures sufficient to provide reasonable assurance (i) that Meerkat maintains records that in reasonable detail accurately and fairly reflect Meerkat's transactions and dispositions of assets, (ii) that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP, (iii) that receipts and expenditures are made only in accordance with authorizations of management and the Meerkat Board, and (iv) regarding prevention or timely detection of the unauthorized acquisition, use or disposition of Meerkat's assets that could have a material effect on Meerkat's financial statements. Meerkat has evaluated the effectiveness of Meerkat's internal control over financial reporting and, to the extent required by applicable Law, presented in any applicable Meerkat SEC Document that is a report on Form 10-K or Form 10-Q (or any amendment thereto) its conclusions about the effectiveness of the internal control over financial reporting as of the end of the period covered by such report or amendment based on such evaluation. Meerkat has disclosed to Meerkat's auditors and the Audit Committee of the Meerkat Board (and made available to the Company a summary of the significant aspects of such disclosure) (A) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting that are reasonably likely to adversely affect Meerkat's ability to record, process, summarize and report financial information and (B) any fraud, whether or not material, that involves management or other employees who have a significant role in Meerkat's or its Subsidiaries' internal control over financial reporting. Except as disclosed in the Meerkat SEC Documents filed prior to the date hereof, Meerkat has not identified any material weaknesses in the design or operation of Meerkat's internal control over financial reporting. Since January 1, 2014, there have been no material changes in Meerkat's internal control over financial reporting.

(h) Meerkat's "disclosure controls and procedures" (as defined in Rules 13a-15(e) and 15d-15(e) of the Exchange Act) are reasonably designed to ensure that all information (both financial and non-financial) required to be disclosed by Meerkat in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the rules and forms of the SEC, and that all such information is accumulated and communicated to Meerkat's management as appropriate to allow timely decisions regarding required disclosure and to make the Certifications.

3.8 Absence of Changes. Except as set forth on Section 3.8 of the Meerkat Disclosure Schedule, between December 31, 2016, and the date of this Agreement, Meerkat has conducted its business only in the Ordinary Course of Business (except for the execution and performance of this Agreement and the discussions, negotiations and transactions related thereto) and there has not been any (a) Meerkat Material Adverse Effect or (b) action, event or occurrence that would have required consent of the Company pursuant to Section 4.1(b) of this Agreement had such action, event or occurrence taken place after the execution and delivery of this Agreement.

3.9 Absence of Undisclosed Liabilities. As of the date hereof, Meerkat does not have any Liability, individually or in the aggregate, except for: (a) Liabilities identified as such in the "liabilities" column of the Meerkat Unaudited Interim Balance Sheet; (b) normal and recurring current Liabilities that have been incurred by Meerkat since the date of the Meerkat Unaudited Interim Balance Sheet in the Ordinary Course of Business

and which are not in excess of $250,000, in the aggregate; (c) Liabilities for performance of obligations of Meerkat under Meerkat Contracts; (d) Liabilities incurred in connection with the Contemplated Transactions; and (e) Liabilities described in Section 3.9 of the Meerkat Disclosure Schedule.

3.10 Title to Assets. Meerkat owns, and has good and valid title to, or, in the case of leased properties and assets, valid leasehold interests in, all tangible properties or assets and equipment used or held for use in its business or operations or purported to be owned by it, including: (a) all assets reflected on the Meerkat Unaudited Interim Balance Sheet; and (b) all other assets reflected in the books and records of Meerkat as being owned by Meerkat. All of such assets are owned or, in the case of leased assets, leased by Meerkat free and clear of any Encumbrances, other than Permitted Encumbrances.

3.11 Real Property; Leasehold.

(a) Meerkat does not own and has never owned any real property. Meerkat has made available to the Company (a) an accurate and complete list of all real properties with respect to which Meerkat directly or indirectly holds a valid leasehold interest as well as any other real estate that is in the possession of or leased by Meerkat (the "***Meerkat Leased Real Property***"), and (b) copies of all leases under which any such real property is possessed (the "***Meerkat Real Estate Leases***"), each of which is in full force and effect, with no existing material default thereunder.

(b) Meerkat has not received any written notice from any Governmental Body of a violation of any governmental requirements (including Environmental Laws) with respect to any of the Meerkat Leased Real Property and, to Meerkat's Knowledge, the Meerkat Leased Real Property is not in violation of any material governmental requirements.

3.12 Intellectual Property

(a) To the Knowledge of Meerkat, Meerkat owns, or has the right to use, as currently being used by Meerkat, all Meerkat IP Rights, and with respect to Meerkat IP Rights that are owned by Meerkat, has the right to bring actions for the infringement of such Meerkat IP Rights, in each case except for any failure to own or have the right to use or bring actions that would not have a Meerkat Material Adverse Effect.

(b) Section 3.12(b) of the Meerkat Disclosure Schedule is an accurate, true and complete listing of all Meerkat Registered IP.

(c) Section 3.12(c) of the Meerkat Disclosure Schedule accurately identifies (i) all Meerkat Contracts pursuant to which Meerkat IP Rights are licensed to Meerkat (other than (A) any non-customized software that (1) is so licensed solely in executable or object code form pursuant to a non-exclusive, internal use software license and other Intellectual Property associated with such software and (2) is not incorporated into, or material to the development, manufacturing, or distribution of, any of Meerkat products or services, (B) any Intellectual Property licensed ancillary to the purchase or use of equipment, reagents or other materials and (C) any confidential information provided under confidentiality agreements), and (ii) whether the license or licenses granted to Meerkat are exclusive or non-exclusive.

(d) Section 3.12(d) of the Meerkat Disclosure Schedule accurately identifies each Meerkat Contract pursuant to which any Person has been granted any license under, or otherwise has received or acquired any right (whether or not currently exercisable) or interest in, any Meerkat IP Rights (other than (i) any confidential information provided under confidentiality agreements; (ii) any non-disclosure or other template agreements entered into in the Ordinary Course of Business; and (iii) any Meerkat IP Rights non-exclusively licensed to suppliers or service providers for the sole purpose of enabling such supplier or service providers to provide services for Meerkat's benefit). Meerkat is not bound by, and no Meerkat IP Rights are subject to, any Contract containing any covenant or other provision that in any way limits or restricts the ability of Meerkat to use, exploit, assert or enforce any Meerkat IP Rights anywhere in the world, in each case as would materially limit the business of Meerkat as currently conducted.

(e) Meerkat solely or jointly owns all right, title, and interest to and in the Meerkat Registered IP listed on Section 3.12(b) of the Meerkat Disclosure Schedule free and clear of any Encumbrances (other than Permitted Encumbrances). Without limiting the generality of the foregoing:

(i) All documents and instruments necessary to register or apply for or renew registration of all Meerkat Registered IP that is solely owned by Meerkat has been validly executed, delivered and filed in a timely manner with the appropriate Governmental Body except for any such failure, individually or collectively, that would not reasonably be expected to have a Meerkat Material Adverse Effect.

(ii) Each Person who is or was an employee or contractor of Meerkat and who is or was involved in the creation or development of any Meerkat IP Rights purported to be owned by Meerkat has signed a written agreement containing an assignment of such Intellectual Property to Meerkat and confidentiality provisions protecting trade secrets and confidential information of Meerkat; provided, that any such agreement with a third party contractor for research, development or manufacturing services on behalf of Meerkat may provide that such third party contractor reserves its rights in improvements to such third party contractor's Intellectual Property or generally applicable research, development or manufacturing technology, in either case that is not specific to any product or service of Meerkat.

(iii) To the Knowledge of Meerkat, no current or former stockholder, officer, director, employee or contractor of Meerkat has any claim, right (whether or not currently exercisable), or interest to or in any Meerkat IP Rights purported to be owned by Meerkat. To the Knowledge of Meerkat, no employee or contractor of Meerkat is (a) bound by or otherwise subject to any Contract restricting him or her from performing his or her duties for Meerkat or (b) in breach of any Contract with any current or former employer or other Person concerning Meerkat IP Rights purported to be owned by Meerkat or confidentiality provisions protecting trade secrets and confidential information comprising Meerkat IP Rights purported to be owned by Meerkat.

(iv) No funding, facilities or personnel of any Governmental Body were used, directly or indirectly, to develop or create, in whole or in part, any Meerkat IP Rights in which Meerkat has an ownership interest.

(v) Meerkat has taken reasonable steps to maintain the confidentiality of and otherwise protect and enforce its rights in all proprietary information that Meerkat holds, or purports to hold, as a trade secret.

(vi) Meerkat has not assigned or otherwise transferred ownership of, or agreed to assign or otherwise transfer ownership of, any Meerkat Registered IP to any other Person.

(vii) To the Knowledge of Meerkat, the Meerkat IP Rights constitute all Intellectual Property necessary for Meerkat to conduct its business as currently conducted.

(f) Meerkat has delivered, or made available to the Company, a complete and accurate copy of all material Meerkat IP Rights Agreements. Meerkat is not a party to any Contract that, as a result of such execution, delivery and performance of this Agreement, will cause the grant of any license or other right to any Meerkat IP Rights or impair the right of Meerkat or the Surviving Corporation and its Subsidiaries to use, sell or license or enforce any Meerkat IP Rights or portion thereof, except for the occurrence of any such grant or impairment that would not individually or in the aggregate, reasonably be expected to result in a Meerkat Material Adverse Effect.

(g) With respect to each of the Meerkat IP Rights Agreements: (i) each such agreement is valid and binding on Meerkat and in full force and effect; (ii) Meerkat has not received any notice of termination or cancellation under such agreement, or received any notice of breach or default under such agreement, which breach has not been cured or waived; and (iii) neither Meerkat, and to the Knowledge of Meerkat, nor any other party to any such agreement, is in breach or default thereof in any material respect.

(h) The manufacture, marketing, license, sale or intended use of any product or technology currently licensed or sold or under preclinical or clinical development by Meerkat, (i) to the Knowledge of Meerkat, does not infringes or misappropriates any valid Intellectual Property right of any other party, which violation, infringement or misappropriation would reasonably be expected to have a Meerkat Material Adverse Effect and (ii) does not violate or constitute a breach of any license or agreement between Meerkat and any third party. To the Knowledge of Meerkat, no third party is infringing upon any Meerkat IP Rights, or violating any license or agreement with Meerkat relating to any Meerkat IP Rights.

(i) To the Knowledge of Meerkat, there is no current or pending Legal Proceeding (including, but not limited to, opposition, interference or other proceeding in any patent or other government office) contesting the validity, ownership or right to use, sell, license or dispose of any Meerkat IP Rights. Meerkat has not received any written notice asserting that any Meerkat IP Rights or the proposed use, sale, license or disposition thereof conflicts with or infringes or misappropriates or will conflict with or infringe or misappropriate the rights of any other party.

(j) Each item of Meerkat IP Rights that is Meerkat Registered IP that is solely owned by Meerkat is and at all times has been filed and maintained in compliance with all applicable Law and all filings, payments and other actions required to be made or taken to maintain such solely owned item of Meerkat Registered IP in full force and effect have been made by the applicable deadline, except for any failure to perform any of the foregoing, individually or collectively, that would not reasonably be expected to have a Meerkat Material Adverse Effect.

(k) To the Knowledge of Meerkat, no trademark (whether registered or unregistered) or trade name owned, used, or applied for by Meerkat conflicts or interferes with any trademark (whether registered or unregistered) or trade name owned, used, or applied for by any other Person. None of the goodwill associated with or inherent in any trademark (whether registered or unregistered) in which Meerkat has or purports to have an ownership interest has been impaired as determined by Meerkat in accordance with GAAP.

(l) Except as may be set forth in the Contracts listed on Section 3.12(c) or 3.12(d) of the Meerkat Disclosure Schedule (i) Meerkat is not bound by any Contract to indemnify, defend, hold harmless, or reimburse any other Person with respect to any Intellectual Property infringement, misappropriation, or similar claim, and (ii) Meerkat has never assumed, or agreed to discharge or otherwise take responsibility for, any existing or potential liability of another Person for infringement, misappropriation, or violation of any Intellectual Property right, which assumption, agreement or responsibility remains in force as of the date of this Agreement.

3.13 Agreements, Contracts and Commitments. Section 3.13 of the Meerkat Disclosure Schedule identifies the following Meerkat Contracts, each effective as of the date of this Agreement (each, a "***Meerkat Material Contract***" and collectively, the "***Meerkat Material Contracts***"):

(i) each Meerkat Contract relating to any material bonus, deferred compensation, severance, incentive compensation, pension, profit-sharing or retirement plans, or any other employee benefit plans or arrangements;

(ii) each Meerkat Contract requiring payments by Meerkat after the date of this Agreement in excess of $150,000 pursuant to its express terms relating to the employment of, or the performance of employment-related services by, any Person, including any employee, consultant or independent contractor, or entity providing employment related, consulting or independent contractor services, not terminable by Meerkat on 90 calendar days' or less notice without liability, except to the extent general principles of wrongful termination law may limit Meerkat's or such successor's ability to terminate employees at will;

(iii) each Meerkat Contract relating to any agreement or plan, including any stock option plan, stock appreciation right plan or stock purchase plan, any of the benefits of which will be increased, or the vesting

of benefits of which will be accelerated, by the occurrence of any of the Contemplated Transactions (either alone or in conjunction with any other event, such as termination of employment), or the value of any of the benefits of which will be calculated on the basis of any of the Contemplated Transactions;

(iv) except as otherwise may be set forth in the Contracts listed on Section 3.12(c), 3.12(d) or 3.12(i) of the Meerkat Disclosure Schedule, each Meerkat Contract relating to any agreement of indemnification or guaranty not entered into in the Ordinary Course of Business;

(v) each Meerkat Contract containing (A) any covenant limiting the freedom of Meerkat or the Surviving Corporation to engage in any line of business or compete with any Person, (B) any most-favored pricing arrangement, (C) any exclusivity provision, or (D) any non-solicitation provision;

(vi) each Meerkat Contract relating to capital expenditures and requiring payments after the date of this Agreement in excess of $250,000 pursuant to its express terms and not cancelable without penalty;

(vii) each Meerkat Contract relating to the disposition or acquisition of material assets or any ownership interest in any Entity;

(viii) each Meerkat Contract relating to any mortgages, indentures, loans, notes or credit agreements, security agreements or other agreements or instruments relating to the borrowing of money or extension of credit in excess of $250,000 or creating any material Encumbrances with respect to any assets of Meerkat or any loans or debt obligations with officers or directors of Meerkat;

(ix) each Meerkat Contract requiring payment by or to Meerkat after the date of this Agreement in excess of $250,000 pursuant to its express terms relating to: (A) any distribution agreement (identifying any that contain exclusivity provisions); (B) any agreement involving provision of services or products with respect to any pre-clinical or clinical development activities of Meerkat; (C) any dealer, distributor, joint marketing, alliance, joint venture, cooperation, development or other agreement currently in force under which Meerkat has continuing obligations to develop or market any product, technology or service, or any agreement pursuant to which Meerkat has continuing obligations to develop any Intellectual Property that will not be owned, in whole or in part, by Meerkat; or (D) any Contract to license any third party to manufacture or produce any product, service or technology of Meerkat or any Contract to sell, distribute or commercialize any products or service of Meerkat, in each case, except for Meerkat Contracts entered into in the Ordinary Course of Business;

(x) each Meerkat Contract with any Person, including any financial advisor, broker, finder, investment banker or other Person, providing advisory services to Meerkat in connection with the Contemplated Transactions;

(xi) each Meerkat Real Estate Lease; or

(xii) any other Meerkat Contract that is not terminable at will (with no penalty or payment) by Meerkat and (A) which involves payment or receipt by Meerkat after the date of this Agreement under any such agreement, contract or commitment of more than $250,000 in the aggregate, or obligations after the date of this Agreement in excess of $250,000 in the aggregate, or (B) that is material to the business or operations of Meerkat, taken as a whole.

Meerkat has delivered or made available to the Company accurate and complete copies of all Meerkat Material Contracts. Meerkat has not nor, to Meerkat's Knowledge as of the date of this Agreement, has any other party to a Meerkat Material Contract, breached, violated or defaulted under, or received notice that it breached, violated or defaulted under, any of the terms or conditions of any Meerkat Material Contract in such manner as would

permit any other party to cancel or terminate any such Meerkat Material Contract, or would permit any other party to seek damages which would reasonably be expected to have a Meerkat Material Adverse Effect. As to Meerkat, as of the date of this Agreement, each Meerkat Material Contract is valid, binding, enforceable and in full force and effect, subject to the Enforceability Exceptions. No Person is renegotiating, or has a right pursuant to the terms of any Meerkat Material Contract to change, any material amount paid or payable to Meerkat under any Meerkat Material Contract or any other material term or provision of any Meerkat Material Contract.

3.14 Compliance; Permits; Restrictions.

(a) Meerkat is, and since January 1, 2014, has been, in compliance in all material respects with all applicable Laws. No investigation, claim, suit, proceeding, audit or other action by any Governmental Body is pending or, to the Knowledge of Meerkat, threatened against Meerkat. There is no agreement, judgment, injunction, order or decree binding upon Meerkat which (i) has or could reasonably be expected to have the effect of prohibiting or materially impairing any business practice of Meerkat, any acquisition of material property by Meerkat or the conduct of business by Meerkat as currently conducted, (ii) is reasonably likely to have an adverse effect on Meerkat's ability to comply with or perform any covenant or obligation under this Agreement, or (iii) is reasonably likely to have the effect of preventing, delaying, making illegal or otherwise interfering with the Contemplated Transactions.

(b) Each of Meerkat and Merger Sub holds all required Governmental Authorizations that are material to the operation of the business of Meerkat and Merger Sub as currently conducted (collectively, the "***Meerkat Permits***"). Section 3.14(b) of the Meerkat Disclosure Schedule identifies each Meerkat Permit. Each of Meerkat and Merger Sub is in material compliance with the terms of the Meerkat Permits. No Legal Proceeding is pending or, to the Knowledge of Meerkat, threatened, which seeks to revoke, limit, suspend, or materially modify any Meerkat Permit. The rights and benefits of each Meerkat Permit will be available to Meerkat and Surviving Corporation immediately after the Effective Time on terms substantially identical to those enjoyed by Meerkat and Merger Sub as of the date of this Agreement and immediately prior to the Effective Time.

(c) There are no proceedings pending or, to the Knowledge of Meerkat, threatened with respect to an alleged material violation by Meerkat of the FDCA, FDA regulations adopted thereunder, the Controlled Substance Act or any other similar Law promulgated by a Drug Regulatory Agency.

(d) Each of Meerkat and Merger Sub holds all required Governmental Authorizations issuable by any Drug Regulatory Agency necessary for the conduct of the business of Meerkat and Merger Sub as currently conducted, and, as applicable, the development, clinical testing, manufacturing, marketing, distribution and importation or exportation, as currently conducted, of any of its products or product candidates (the "***Meerkat Product Candidates***") (the "***Meerkat Regulatory Permits***") and no such Meerkat Regulatory Permit has been (i) revoked, withdrawn, suspended, cancelled or terminated or (ii) modified in any adverse manner other than immaterial adverse modifications. Meerkat is in compliance in all material respects with the Meerkat Regulatory Permits and neither Meerkat nor Merger Sub has received any written notice or other written communication from any Drug Regulatory Agency regarding (A) any material violation of or failure to comply materially with any term or requirement of any Meerkat Regulatory Permit or (B) any revocation, withdrawal, suspension, cancellation, termination or material modification of any Meerkat Regulatory Permit. Except for the information and files identified in Section 3.14(d) of the Meerkat Disclosure Schedule, Meerkat has made available to the Company all information requested by the Company in Meerkat's possession or control relating to the Meerkat Product Candidates and the development, clinical testing, manufacturing, importation and exportation of the Meerkat Product Candidates, including complete copies of the following (to the extent there are any): (x) adverse event reports; clinical study reports and material study data; inspection reports, notices of adverse findings, warning letters, filings and letters and other written correspondence to and from any Drug Regulatory Agency; and meeting minutes with any Drug Regulatory Agency; and (y) similar reports, material study data, notices, letters, filings, correspondence and meeting minutes with any other Governmental Body.

(e) All clinical, pre-clinical and other studies and tests conducted by or on behalf of, or sponsored by, Meerkat or in which Meerkat or its respective products or product candidates, including the Meerkat Product Candidates, have participated were and, if still pending, are being conducted in all material respects in accordance with standard medical and scientific research procedures and in compliance in all material respects with the applicable regulations of the Drug Regulatory Agencies and other applicable Law, including, without limitation, 21 C.F.R. Parts 50, 54, 56, 58 and 312. Other than as set forth on Section 3.14(e) of the Meerkat Disclosure Schedule, since January 1, 2014, neither Meerkat nor Merger Sub has received any notices, correspondence, or other communications from any Drug Regulatory Agency requiring or, to the Knowledge of Meerkat, threatening to initiate, the termination or suspension of any clinical trials conducted by or on behalf of, or sponsored by, Meerkat or in which Meerkat or its current products or product candidates, including the Meerkat Product Candidates, have participated.

(f) Meerkat is not the subject of any pending or, to the Knowledge of Meerkat, threatened investigation in respect of its business or products by the FDA pursuant to its "Fraud, Untrue Statements of Material Facts, Bribery, and Illegal Gratuities" Final Policy set forth in 56 Fed. Reg. 46191 (September 10, 1991) and any amendments thereto. To the Knowledge of Meerkat, Meerkat has not committed any acts, made any statement, or failed to make any statement, in each case in respect of its business or products that would violate FDA's "Fraud, Untrue Statements of Material Facts, Bribery, and Illegal Gratuities" Final Policy, and any amendments thereto. None of Meerkat, Merger Sub, or any of their respective officers, employees or agents has been convicted of any crime or engaged in any conduct that could result in a material debarment or exclusion (i) under 21 U.S.C. Section 335a or (ii) any similar applicable Law. To the Knowledge of Meerkat, no material debarment or exclusionary claims, actions, proceedings or investigations in respect of their business or products are pending or threatened against Meerkat or any of its officers, employees or agents.

3.15 Legal Proceedings; Orders.

(a) Except as set forth in Section 3.15 of the Meerkat Disclosure Schedule, there is no pending Legal Proceeding and, to the Knowledge of Meerkat, no Person has threatened in writing to commence any Legal Proceeding: (i) that involves Meerkat or any Meerkat Associate (in his or her capacity as such) or any of the material assets owned or used by Meerkat; or (ii) that challenges, or that may have the effect of preventing, delaying, making illegal or otherwise interfering with, the Contemplated Transactions.

(b) There is no order, writ, injunction, judgment or decree to which Meerkat, or any of the material assets owned or used by Meerkat is subject. To the Knowledge of Meerkat, no officer or other Key Employee of Meerkat is subject to any order, writ, injunction, judgment or decree that prohibits such officer or employee from engaging in or continuing any conduct, activity or practice relating to the business of Meerkat or to any material assets owned or used by Meerkat.

3.16 Tax Matters.

(a) Each of Meerkat and Merger Sub has timely filed all federal income Tax Returns and other material Tax Returns that they were required to file under applicable Law. All such Tax Returns were correct and complete in all material respects and have been prepared in material compliance with all applicable Law. Subject to exceptions as would not be material, no written claim has ever been made by an authority in a jurisdiction where Meerkat does not file Tax Returns that it is subject to taxation by that jurisdiction.

(b) All material Taxes due and owing by Meerkat on or before the date hereof (whether or not shown on any Tax Return) have been paid. Since the date of the Meerkat Unaudited Interim Balance Sheet, Meerkat has not incurred any material Liability for Taxes outside the Ordinary Course of Business or otherwise inconsistent with past custom and practice.

(c) Each of Meerkat and Merger Sub has withheld and paid all material Taxes required to have been withheld and paid in connection with any amounts paid or owing to any employee, independent contractor, creditor, stockholder, or other third party.

(d) There are no Encumbrances for material Taxes (other than Taxes not yet due and payable) upon any of the assets of Meerkat.

(e) No deficiencies for material Taxes with respect to Meerkat have been claimed, proposed or assessed by any Governmental Body in writing. There are no pending (or, based on written notice, threatened) material audits, assessments or other actions for or relating to any liability in respect of Taxes of Meerkat. Meerkat (nor Merger Sub or any of their predecessors) has not waived any statute of limitations in respect of material Taxes or agreed to any extension of time with respect to a material Tax assessment or deficiency.

(f) Meerkat has never been a United States real property holding corporation within the meaning of Section 897(c)(2) of the Code during the applicable period specified in Section 897(c)(1)(A)(ii) of the Code.

(g) Meerkat is a not party to any material Tax allocation, Tax sharing or similar agreement (including indemnity arrangements), other than commercial contracts entered into in the Ordinary Course of Business with vendors, customers and landlords.

(h) Meerkat has never been a member of an affiliated group filing a consolidated U.S. federal income Tax Return (other than a group the common parent of which is Meerkat). Meerkat does not have any material Liability for the Taxes of any Person (other than Meerkat and Merger Sub) under Treasury Regulations Section 1.1502-6 (or any similar provision of state, local, or foreign law) or as a transferee or successor.

(i) Meerkat has not distributed stock of another Person, or had its stock distributed by another Person, in a transaction that was purported or intended to be governed in whole or in Section by Section 355 of the Code or Section 361 of the Code in the last two years.

(j) Meerkat has not entered into any transaction identified as a “reportable transaction” for purposes of Treasury Regulations Section 1.6011-4(b).

3.17 Employee and Labor Matters; Benefit Plans.

(a) The employment of each of Meerkat’s and any of its Subsidiaries’ employees is terminable by Meerkat or the applicable Subsidiary at will (or otherwise in accordance with general principles of wrongful termination law). Meerkat has made available to the Company accurate and complete copies of all employee manuals and handbooks, disclosure materials, policy statements and other materials relating to the employment of Meerkat Associates to the extent currently effective and material.

(b) Neither Meerkat nor any of its Subsidiaries is a party to, bound by, or has a duty to bargain under, any collective bargaining agreement or other Contract with a labor organization representing any of its employees, and there are no labor organizations representing or, to the Knowledge of Meerkat, purporting to represent or seeking to represent any employees of Meerkat or its Subsidiaries.

(c) Section 3.17(c) of the Meerkat Disclosure Schedule lists all written and describes all non-written employee benefit plans (as defined in Section 3(3) of ERISA) and all bonus, equity-based, incentive, deferred compensation, retirement or supplemental retirement, profit sharing, severance, golden parachute, vacation, cafeteria, dependent care, medical care, employee assistance program, education or tuition assistance programs and other similar material fringe or employee benefit plans, programs or arrangements, including any employment or executive compensation or severance agreements, written or otherwise, which are currently in effect relating to any present or former employee or director of Meerkat or any of its Subsidiaries (or any trade or

business (whether or not incorporated) which is a Meerkat Affiliate) or which is maintained by, administered or contributed to by, or required to be contributed to by, Meerkat, any of its Subsidiaries or any Meerkat Affiliate, or under which Meerkat or any of its Subsidiaries or any Meerkat Affiliate has any current liability or may incur liability after the date hereof (each, a "***Meerkat Employee Plan***").

(d) With respect to each Meerkat Employee Plan, Meerkat has made available to the Company a true and complete copy of, to the extent applicable, (i) such Meerkat Employee Plan, (ii) the three most recent annual report (Form 5500) as filed with the IRS, (iii) each currently effective trust agreement related to such Meerkat Employee Plan, (iv) the most recent summary plan description for each Meerkat Employee Plan for which such description is required, along with all summaries of material modifications, amendments, resolutions and all other material plan documentation related thereto in the possession of Meerkat, and (v) the most recent IRS determination or opinion letter or analogous ruling under foreign law issued with respect to any Meerkat Employee Plan.

(e) Each Meerkat Employee Plan that is intended to be qualified under Section 401(a) of the Code has received a favorable determination or opinion letter with respect to such qualified status from the IRS. To the Knowledge of Meerkat, nothing has occurred that would reasonably be expected to adversely affect the qualified status of any such Meerkat Employee Plan or the exempt status of any related trust.

(f) Each Meerkat Employee Plan has been maintained in compliance, in all material respects, with its terms and, both as to form and operation, with all applicable Law, including the Code and ERISA.

(g) Neither Meerkat nor any of its Subsidiaries has engaged in any transaction in violation of Sections 404 or 406 of ERISA or any "prohibited transaction," as defined in Section 4975(c)(1) of the Code, for which no exemption exists under Section 408 of ERISA or Section 4975(c)(2) or (d) of the Code, or has otherwise violated the provisions of Part 4 of Title I, Subtitle B of ERISA. Neither Meerkat nor any of its Subsidiaries has knowingly participated in a violation of Part 4 of Title I, Subtitle B of ERISA by any plan fiduciary of any Meerkat Employee Plan subject to ERISA and neither Meerkat nor any of its Subsidiaries has been assessed any civil penalty under Section 502(l) of ERISA.

(h) No Meerkat Employee Plan is subject to Title IV or Section 302 of ERISA or Section 412 of the Code, and neither Meerkat nor any of its ERISA Affiliates has ever maintained, contributed to or partially or completely withdrawn from, or incurred any obligation or liability with respect to, any such plan. No Meerkat Employee Plan is a Multiemployer Plan, and neither Meerkat nor any of its ERISA Affiliates has ever contributed to or had an obligation to contribute, or incurred any liability in respect of a contribution, to any Multiemployer Plan. No Meerkat Employee Plan is a Multiple Employer Plan. No Meerkat Employee Plan is a Multiple Employer Welfare Arrangement. Neither Meerkat nor any of its ERISA Affiliates sponsors or maintains any self-funded welfare employee benefit plan.

(i) Except as set forth in Section 3.17(i) of the Meerkat Disclosure Schedule, no Meerkat Employee Plan provides for medical or death benefits beyond termination of service or retirement, other than (i) pursuant to COBRA or an analogous state law requirement or (ii) death or retirement benefits under a Meerkat Employee Plan qualified under Section 401(a) of the Code. No Meerkat Employee Plan is subject to any Law of a foreign jurisdiction outside of the United States.

(j) With respect to Meerkat Options granted pursuant to the Meerkat Stock Plans, (i) each Meerkat Option intended to qualify as an "incentive stock option" under Section 422 of the Code so qualifies, (ii) each grant of a Meerkat Option was duly authorized no later than the Grant Date by all necessary corporate action, including, as applicable, approval by the Meerkat Board (or a duly constituted and authorized committee thereof) and any required stockholder approval by the necessary number of votes or written consents, and the award agreement governing such grant (if any) was duly executed and delivered by each party thereto, (iii) each Meerkat Option grant was made in accordance with the terms of the Meerkat Stock Plans and all other applicable

Law and regulatory rules or requirements and (iv) the per share exercise price of each Meerkat Option was not less than the fair market value of a share of Meerkat Common Stock on the applicable Grant Date.

(k) To the Knowledge of Meerkat, no Meerkat Options or other equity-based awards issued or granted by Meerkat are subject to the requirements of Code Section 409A. To the Knowledge of Meerkat, each 409A Plan under which Meerkat makes, is obligated to make or promises to make, payments complies in all material respects, in both form and operation, with the requirements of Code Section 409A and the guidance thereunder. No payment to be made under any 409A Plan is or, to the Knowledge of Meerkat will be, subject to the penalties of Code Section 409A(a)(1).

(l) Meerkat and each of its Subsidiaries is in material compliance with all of its bonus, commission and other compensation plans and has paid any and all amounts required to be paid under such plans, including any and all bonuses and commissions (or pro rata portion thereof) that may have accrued or been earned through the calendar quarter preceding the Effective Time, and is not liable for any material payments, taxes or penalties for failure to comply with any of the terms or conditions of such plans or the laws governing such plans.

(m) Meerkat and each of its Subsidiaries is in material compliance with all applicable foreign, federal, state and local laws, rules and regulations respecting employment, employment practices, terms and conditions of employment, worker classification, tax withholding, prohibited discrimination, equal employment, fair employment practices, meal and rest periods, immigration status, employee safety and health, wages (including overtime wages), compensation, and hours of work, and in each case, with respect to the employees of Meerkat and its Subsidiaries: (i) has withheld and reported all material amounts required by law or by agreement to be withheld and reported with respect to wages, salaries and other payments to employees, (ii) is not liable for any arrears of wages, severance pay or any Taxes or any penalty for failure to comply with any of the foregoing, and (iii) is not liable for any material payment to any trust or other fund governed by or maintained by or on behalf of any governmental authority, with respect to unemployment compensation benefits, social security or other benefits or obligations for employees (other than routine payments to be made in the Ordinary Course of Business). To the Knowledge of Meerkat, there are no pending or threatened or reasonably anticipated claims or actions against Meerkat, any of its Subsidiaries, any Meerkat trustee or any trustee of any Subsidiary under any workers' compensation policy or long-term disability policy. Neither Meerkat nor any Subsidiary thereof is a party to a conciliation agreement, consent decree or other agreement or order with any federal, state, or local agency or governmental authority with respect to employment practices.

(n) Section 3.17(n) of the Meerkat Disclosure Schedule lists all liabilities of Meerkat or any of its Subsidiaries to any employee that result from the termination by Meerkat or any of its Subsidiaries of such employee's employment or provision of services, a change of control of Meerkat, or a combination thereof. Neither Meerkat nor any of its Subsidiaries has any material liability with respect to any misclassification of: (a) any Person as an independent contractor rather than as an employee, (b) any employee leased from another employer, or (c) any employee currently or formerly classified as exempt from overtime wages. Neither Meerkat nor any of its Subsidiaries has taken any action which would constitute a "plant closing" or "mass layoff" within the meaning of the WARN Act or similar state or local law, issued any notification of a plant closing or mass layoff required by the WARN Act or similar state or local law, or incurred any liability or obligation under WARN or any similar state or local law that remains unsatisfied. No terminations of employees of Meerkat or any of its Subsidiaries prior to the Closing would trigger any notice or other obligations under the WARN Act or similar state or local law.

(o) There has never been, nor has there been any threat of, any strike, slowdown, work stoppage, lockout, job action, union, organizing activity, question concerning representation or any similar activity or dispute, affecting Meerkat or any of its Subsidiaries. No event has occurred, and no condition or circumstance exists, that might directly or indirectly be likely to give rise to or provide a basis for the commencement of any such strike, slowdown, work stoppage, lockout, job action, union organizing activity, question concerning representation or any similar activity or dispute.

(p) Neither Meerkat nor any of its Subsidiaries is, nor has Meerkat or any of its Subsidiaries been, engaged in any unfair labor practice within the meaning of the National Labor Relations Act. There is no Legal Proceeding, claim, labor dispute or grievance pending or, to the Knowledge of Meerkat, threatened or reasonably anticipated relating to any employment contract, privacy right, labor dispute, wages and hours, leave of absence, plant closing notification, workers' compensation policy, long-term disability policy, harassment, retaliation, immigration, employment statute or regulation, safety or discrimination matter involving any Meerkat Associate, including charges of unfair labor practices or discrimination complaints. There are no actions, suits, claims or administrative matters pending or, to the Knowledge of Meerkat, threatened or reasonably anticipated against Meerkat or any of its Subsidiaries relating to any employee, employment agreement or Meerkat Employee Plan (other than routine claims for benefits).

(q) There is no contract, agreement, plan or arrangement to which Meerkat or any Meerkat Affiliate is a party or by which it is bound to compensate any of its employees for excise taxes paid pursuant to Section 4999 of the Code.

(r) Meerkat is not a party to any Contract that has resulted or would reasonably be expected to result, separately or in the aggregate, in the payment of (i) any "excess parachute payment" within the meaning of Section 280G of the Code or (ii) any amount the deduction for which would be disallowed under Section 162(m) of the Code.

3.18 Environmental Matters. Since January 1, 2014, Meerkat has complied with all applicable Environmental Laws, which compliance includes the possession by Meerkat of all permits and other Governmental Authorizations required under applicable Environmental Laws and compliance with the terms and conditions thereof, except for any failure to be in compliance that, individually or in the aggregate, would not result in a Meerkat Material Adverse Effect. Meerkat has not received since January 1, 2014, any written notice or other communication (in writing or otherwise), whether from a Governmental Body, citizens group, employee or otherwise, that alleges that Meerkat is not in compliance with any Environmental Law, and, to the Knowledge of Meerkat, there are no circumstances that may prevent or interfere with Meerkat's compliance with any Environmental Law in the future, except where such failure to comply would not reasonably be expected to have a Meerkat Material Adverse Effect. To the Knowledge of Meerkat: (i) no current or prior owner of any property leased or controlled by Meerkat has received since January 1, 2014, any written notice or other communication relating to property owned or leased at any time by Meerkat, whether from a Governmental Body, citizens group, employee or otherwise, that alleges that such current or prior owner or Meerkat is not in compliance with or violated any Environmental Law relating to such property and (ii) Meerkat has no material liability under any Environmental Law.

3.19 Insurance. Meerkat has made available to the Company accurate and complete copies of all material insurance policies and all material self-insurance programs and arrangements relating to the business, assets, liabilities and operations of Meerkat and Merger Sub. Each of such insurance policies is in full force and effect and Meerkat and Merger Sub are in compliance in all material respects with the terms thereof. Other than customary end of policy notifications from insurance carriers, since January 1, 2014, Meerkat has not received any notice or other communication regarding any actual or possible: (i) cancellation or invalidation of any insurance policy; or (ii) refusal or denial of any coverage, reservation of rights or rejection of any material claim under any insurance policy. Each of Meerkat and Merger Sub has provided timely written notice to the appropriate insurance carrier(s) of each Legal Proceeding pending against Meerkat for which Meerkat has insurance coverage, and no such carrier has issued a denial of coverage or a reservation of rights with respect to any such Legal Proceeding, or informed Meerkat of its intent to do so.

3.20 Transactions with Affiliates. Except as set forth in the Meerkat SEC Documents filed prior to the date of this Agreement, since the date of Meerkat's last proxy statement filed in 2016 with the SEC, no event has occurred that would be required to be reported by Meerkat pursuant to Item 404 of Regulation S-K promulgated by the SEC. Section 3.20 of the Meerkat Disclosure Schedule identifies each Person who is (or who may be deemed to be) an Affiliate of Meerkat as of the date of this Agreement.

3.21 No Financial Advisors. Except as set forth on Section 3.21 of the Meerkat Disclosure Schedule, no broker, finder or investment banker is entitled to any brokerage fee, finder's fee, opinion fee, success fee, transaction fee or other fee or commission in connection with the Contemplated Transactions based upon arrangements made by or on behalf of Meerkat.

3.22 Valid Issuance. The Meerkat Common Stock to be issued in the Merger will, when issued in accordance with the provisions of this Agreement, be validly issued, fully paid and nonassessable.

3.23 Inapplicability of Anti-takeover Statutes. The Boards of Directors of Meerkat and Merger Sub have taken and will take all actions necessary to ensure that the restrictions applicable to business combinations contained in Section 203 of the DGCL are, and will be, inapplicable to the execution, delivery and performance of this Agreement and the Meerkat Stockholder Support Agreements and to the consummation of the Merger and the other Contemplated Transactions. No other state takeover statute or similar Law applies or purports to apply to the Merger, this Agreement, the Meerkat Stockholder Support Agreements or any of the other Contemplated Transactions.

3.24 CPRIT Matters. Set forth on Schedule A are accurate and complete copies of agreements between Meerkat and CPRIT with respect to Meerkat's existing grants made by CPRIT. Meerkat has complied with all material obligations under such agreements. Meerkat has not entered into any agreement or other arrangement with CPRIT relating to Meerkat's existing grants made by CPRIT other than as set forth on Schedule A.

3.25 Disclosure. The information supplied by Meerkat for inclusion or incorporation by reference in the Proxy Statement (including any of the Meerkat Financials) will not, as of the date of the Proxy Statement or as of the date such information is prepared or presented, (i) contain any statement that is inaccurate or misleading with respect to any material facts, or (ii) omit to state any material fact necessary in order to make such information, in light of the circumstances under which such information will be provided, not false or misleading. The Proxy Statement will comply in all material respects as to form with the requirements of the Exchange Act and the rules and regulations thereunder.

3.26 No Other Representations or Warranties. Meerkat hereby acknowledges and agrees that, except for the representations and warranties contained in this Agreement, neither the Company nor any of its Subsidiaries nor any other person on behalf of the Company or its Subsidiaries makes any express or implied representation or warranty with respect to the Company or its Subsidiaries or with respect to any other information provided to Meerkat, Merger Sub or stockholders or any of their respective Affiliates in connection with the transactions contemplated hereby, and (subject to the express representations and warranties of the Company set forth in Section 2 (in each case as qualified and limited by the Company Disclosure Schedule)) none of Meerkat, Merger Sub or any of their respective Representatives or stockholders, has relied on any such information (including the accuracy or completeness thereof).

Section 4 Certain Covenants of the Parties

4.1 Operation of Meerkat's Business.

(a) Except as set forth on Section 4.1(a) of the Meerkat Disclosure Schedule, as expressly contemplated or permitted by this Agreement, as required by applicable Law or unless the Company shall otherwise consent in writing (which consent shall not be unreasonably withheld, delayed or conditioned), during the period commencing on the date of this Agreement and continuing until the earlier to occur of the termination of this Agreement pursuant to Section 9 and the Effective Time (the ***"Pre-Closing Period"***): Meerkat shall (i) conduct its business and operations in the Ordinary Course of Business; (ii) continue to pay outstanding accounts payable and other current Liabilities (including payroll) when due and payable; and (iii) conduct its business and operations in compliance with all applicable Law and the requirements of all Contracts that constitute Meerkat Material Contracts.

(b) Except (i) as expressly contemplated or permitted by this Agreement, (ii) as set forth in Section 4.1(b) of the Meerkat Disclosure Schedule, (iii) as required by applicable Law or (iv) with the prior written consent of the Company (which consent shall not be unreasonably withheld, delayed or conditioned), at all times during the Pre-Closing Period, Meerkat shall not:

(i) declare, accrue, set aside or pay any dividend or make any other distribution in respect of any shares of its capital stock or repurchase, redeem or otherwise reacquire any shares of its capital stock or other securities (except for shares of Meerkat Common Stock from terminated employees, directors or consultants of Meerkat);

(ii) sell, issue, grant, pledge or otherwise dispose of or encumber or authorize the issuance of: (A) any capital stock or other security (except for Meerkat Common Stock issued upon the valid exercise of outstanding Meerkat Options); (B) any option, warrant or right to acquire any capital stock or any other security; or (C) any instrument convertible into or exchangeable for any capital stock or other security;

(iii) except as required to give effect to anything in contemplation of the Closing, amend any of its Organizational Documents, or effect or be a party to any merger, consolidation, share exchange, business combination, recapitalization, reclassification of shares, stock split, reverse stock split or similar transaction except, for the avoidance of doubt, the Contemplated Transactions;

(iv) form any Subsidiary or acquire any equity interest or other interest in any other Entity or enter into a joint venture with any other Entity;

(v) (A) lend money to any Person, (B) incur or guarantee any indebtedness for borrowed money, (C) guarantee any debt securities of others, (D) make any capital expenditure or commitment or (E) forgive any loans to any Persons, including Meerkat's employees, officers, directors or Affiliates;

(vi) (A) adopt, establish or enter into any Meerkat Employee Plan; (B) cause or permit any Meerkat Employee Plan to be amended other than as required by law or in order to make amendments for the purposes of Section 409A of the Code; (C) pay any bonus or make any profit-sharing or similar payment to, or increase the amount of the wages, salary, commissions, fringe benefits or other compensation or remuneration payable to, any of its employees, directors or consultants; or (D) increase the severance or change of control benefits offered to any current or new employees, directors or consultants;

(vii) enter into any material transaction outside the Ordinary Course of Business;

(viii) acquire any material asset or sell, lease or otherwise irrevocably dispose of any of its assets or properties, or grant any Encumbrance with respect to such assets or properties, except in the Ordinary Course of Business;

(ix) sell, assign, transfer, license, sublicense or otherwise dispose of any material Meerkat IP Rights (other than pursuant to non-exclusive licenses in the Ordinary Course of Business);

(x) make, change or revoke any material Tax election; file any material amendment to any Tax Return or adopt or change any accounting method in respect of Taxes;

(xi) take any action, other than as required by Law or GAAP, to change accounting policies or procedures;

(xii) pay, discharge or satisfy any claims, liabilities or obligations (absolute, accrued, asserted or unasserted, contingent or otherwise), other than the payment, discharge or satisfaction in the Ordinary Course of Business and consistent with past practice of liabilities reflected or reserved against in the Meerkat Financials, or incurred in the Ordinary Course of Business and consistent with past practice;

(xiii) except as set forth in Section 4.1(b)(xiii) of the Meerkat Disclosure Schedule, enter into, amend or terminate any Meerkat Material Contract;

(xiv) (A) materially change pricing or royalties or other payments set or charged by Meerkat to its customers or licensees or (B) agree to materially change pricing or royalties or other payments set or charged by persons who have licensed Intellectual Property to Meerkat;

(xv) after the Net Cash Calculation is finalized pursuant to Section 1.6, incur any Liabilities or otherwise take any actions other than, in each case, in the Ordinary Course of Business or in connection with the transactions contemplated by this Agreement;

(xvi) initiate or settle any Legal Proceeding or other claim or dispute involving or against Meerkat or any Subsidiary of Meerkat.

(xvii) agree, resolve or commit to do any of the foregoing.

Nothing contained in this Agreement shall give the Company, directly or indirectly, the right to control or direct the operations of Meerkat prior to the Effective Time. Prior to the Effective Time, Meerkat shall exercise, consistent with the terms and conditions of this Agreement, complete unilateral control and supervision over its business operations.

4.2 Operation of the Company's Business.

(a) Except as set forth on Section 4.2(a) of the Company Disclosure Schedule, as expressly contemplated or permitted by this Agreement, as required by applicable Law or unless Meerkat shall otherwise consent in writing (which consent shall not be unreasonably withheld, delayed or conditioned), during the Pre-Closing Period: each of the Company and its Subsidiaries shall conduct its business and operations in the Ordinary Course of Business and in compliance with all applicable Law and the requirements of all Contracts that constitute Company Material Contracts.

(b) Except (i) as expressly contemplated or permitted by this Agreement, (ii) as set forth in Section 4.2(b) of the Company Disclosure Schedule, (iii) as required by applicable Law, or (iv) with the prior written consent of Meerkat (which consent shall not be unreasonably withheld, delayed or conditioned), at all times during the Pre-Closing Period, the Company shall not, nor shall it cause or permit any of its Subsidiaries to, do any of the following:

(i) declare, accrue, set aside or pay any dividend or make any other distribution in respect of any shares of capital stock; or repurchase, redeem or otherwise reacquire any shares of Company Capital Stock or other securities (except for shares of Company Common Stock from terminated employees, directors or consultants of the Company);

(ii) except as required to give effect to anything in contemplation of the Closing, amend any of its or its Subsidiaries' Organizational Documents, or effect or be a party to any merger, consolidation, share exchange, business combination, recapitalization, reclassification of shares, stock split, reverse stock split or similar transaction except, for the avoidance of doubt, the Contemplated Transactions;

(iii) except in connection with the hiring of any new employees, sell, issue, grant, pledge or otherwise dispose of or encumber or authorize any of the foregoing actions with respect to: (A) any capital stock or other security of the Company or any of its Subsidiaries (except for shares of outstanding Company Common Stock issued upon the valid exercise of Company Options); (B) any option, warrant or right to acquire any capital stock or any other security; or (C) any instrument convertible into or exchangeable for any capital stock or other security of the Company or any of its Subsidiaries;

(iv) form any Subsidiary or acquire any equity interest or other interest in any other Entity or enter into a joint venture with any other Entity;

(v) (A) lend money to any Person, (B) incur or guarantee any indebtedness for borrowed money, other than in the Ordinary Course of Business, (C) guarantee any debt securities of others, or (D) make any capital expenditure or commitment in excess of $1,000,000;

(vi) other than in the Ordinary Course of Business: (A) adopt, establish or enter into any Company Employee Plan; (B) cause or permit any Company Employee Plan to be amended other than as required by law or in order to make amendments for the purposes of Section 409A of the Code; or (C) pay any bonus or make any profit-sharing or similar payment to, or increase the amount of the wages, salary, commissions, fringe benefits or other compensation or remuneration payable to, any of its directors, officers or employees;

(vii) enter into any material transaction outside the Ordinary Course of Business;

(viii) acquire any material asset or sell, lease or otherwise irrevocably dispose of any of its assets or properties, or grant any Encumbrance with respect to such assets or properties, except in the Ordinary Course of Business;

(ix) sell, assign, transfer, license, sublicense or otherwise dispose of any material Company IP Rights (other than pursuant to non-exclusive licenses in the Ordinary Course of Business);

(x) make, change or revoke any material Tax election; file any material amendment to any Tax Return or adopt or change any accounting method in respect of Taxes;

(xi) enter into, amend or terminate any Company Material Contract;

(xii) (A) materially change pricing or royalties or other payments set or charged by the Company or any of its Subsidiaries to its customers or licensees or (B) agree to materially change pricing or royalties or other payments set or charged by persons who have licensed Intellectual Property to the Company or any of its Subsidiaries; or

(xiii) initiate or settle any Legal Proceeding or other claim or dispute involving or against the Company or any Subsidiary of the Company.

(xiv) agree, resolve or commit to do any of the foregoing.

Nothing contained in this Agreement shall give Meerkat, directly or indirectly, the right to control or direct the operations of the Company prior to the Effective Time. Prior to the Effective Time, the Company shall exercise, consistent with the terms and conditions of this Agreement, complete unilateral control and supervision over its business operations.

4.3 Access and Investigation. Subject to the terms of the Confidentiality Agreement, which the Parties agree will continue in full force following the date of this Agreement, during the Pre-Closing Period, upon reasonable notice, Meerkat, on the one hand, and the Company, on the other hand, shall and shall use commercially reasonable efforts to cause such Party's Representatives to: (a) provide the other Party and such other Party's Representatives with reasonable access during normal business hours to such Party's Representatives, personnel and assets and to all existing books, records, Tax Returns, work papers and other documents and information relating to such Party and its Subsidiaries; (b) provide the other Party and such other Party's Representatives with such copies of the existing books, records, Tax Returns, work papers, product data, and other documents and information relating to such Party and its Subsidiaries, and with such additional financial, operating and other data and information regarding such Party and its Subsidiaries as the other Party

may reasonably request; and (c) permit the other Party's officers and other employees to meet, upon reasonable notice and during normal business hours, with the chief financial officer and other officers and managers of such Party responsible for such Party's financial statements and the internal controls of such Party to discuss such matters as the other Party may deem necessary. Any investigation conducted by either Meerkat or the Company pursuant to this Section 4.3 shall be conducted in such manner as not to interfere unreasonably with the conduct of the business of the other Party.

Notwithstanding the foregoing, any Party may restrict the foregoing access to the extent that any Law applicable to such Party requires such Party to restrict or prohibit access to any such properties or information.

4.4 No Solicitation.

(a) Each of Meerkat and the Company agrees that, during the Pre-Closing Period, neither it nor any of its Subsidiaries shall, nor shall it or any of its Subsidiaries authorize any of its Representatives to, directly or indirectly: (i) solicit, initiate or knowingly encourage, induce or facilitate the communication, making, submission or announcement of any Acquisition Proposal or Acquisition Inquiry or take any action that could reasonably be expected to lead to an Acquisition Proposal or Acquisition Inquiry; (ii) furnish any non-public information regarding such Party to any Person in connection with or in response to an Acquisition Proposal or Acquisition Inquiry; (iii) engage in discussions or negotiations with any Person with respect to any Acquisition Proposal or Acquisition Inquiry; (iv) approve, endorse or recommend any Acquisition Proposal (subject to Section 5.2 and Section 5.3); or (v) execute or enter into any letter of intent or similar document or any Contract contemplating or otherwise relating to any Acquisition Transaction; *provided*, *however*, that, notwithstanding anything contained in this Section 4.4 and subject to compliance with this Section 4.4, prior to the approval of this Agreement by a Party's stockholders (*i.e.*, the Required Company Stockholder Vote, in the case of the Company and its Subsidiaries, or the Required Meerkat Stockholder Vote in the case of Meerkat), such Party may furnish non-public information regarding such Party and its Subsidiaries to, and enter into discussions or negotiations with, any Person in response to a bona fide written Acquisition Proposal by such Person which such Party's board of directors determines in good faith, after consultation with such Party's financial advisors and outside legal counsel, constitutes, or is reasonably likely to result in, a Superior Offer (and is not withdrawn) if: (A) neither such Party nor any Representative of such Party shall have breached this Section 4.4 in any material respect, (B) the board of directors of such Party concludes in good faith based on the advice of outside legal counsel, that the failure to take such action is reasonably likely to be inconsistent with the fiduciary duties of the board of directors of such Party under applicable Law; (C) at least two (2) Business Days prior to initially furnishing any such nonpublic information to, or entering into discussions with, such Person, such Party gives the other Party written notice of the identity of such Person and of such Party's intention to furnish nonpublic information to, or enter into discussions with, such Person; (D) such Party receives from such Person an executed confidentiality agreement containing provisions (including nondisclosure provisions, use restrictions, non-solicitation provisions, no hire and "standstill" provisions) at least as favorable to such Party as those contained in the Confidentiality Agreement; and (E) at least two (2) Business Days prior to furnishing any such nonpublic information to such Person, such Party furnishes such nonpublic information to the other Party (to the extent such information has not been previously furnished by such Party to the other Party). Without limiting the generality of the foregoing, each Party acknowledges and agrees that, in the event any Representative of such Party takes any action that, if taken by such Party, would constitute a breach of this Section 4.4 by such Party, the taking of such action by such Representative shall be deemed to constitute a breach of this Section 4.4 by such Party for purposes of this Agreement.

(b) If any Party or any Representative of such Party receives an Acquisition Proposal or Acquisition Inquiry at any time during the Pre-Closing Period, then such Party shall promptly (and in no event later than one Business Day after such Party becomes aware of such Acquisition Proposal or Acquisition Inquiry) advise the other Party orally and in writing of such Acquisition Proposal or Acquisition Inquiry (including the identity of the Person making or submitting such Acquisition Proposal or Acquisition Inquiry, and the terms thereof). Such

Party shall keep the other Party reasonably informed with respect to the status and terms of any such Acquisition Proposal or Acquisition Inquiry and any material modification or material proposed modification thereto.

(c) Each Party shall immediately cease and cause to be terminated any existing discussions, negotiations and communications with any Person that relate to any Acquisition Proposal or Acquisition Inquiry as of the date of this Agreement and request the destruction or return of any nonpublic information provided to such Person.

4.5 Notification of Certain Matters. During the Pre-Closing Period, each of the Company, on the one hand, and Meerkat, on the other hand, shall promptly notify the other (and, if in writing, furnish copies of) if any of the following occurs: (a) any notice or other communication is received from any Person alleging that the Consent of such Person is or may be required in connection with any of the Contemplated Transactions; (b) any Legal Proceeding against or involving or otherwise affecting such Party or its Subsidiaries is commenced, or, to the Knowledge of such Party, threatened against such Party or, to the Knowledge of such Party, any director, officer or Key Employee of such Party; (c) such Party becomes aware of any inaccuracy in any representation or warranty made by such Party in this Agreement; or (d) the failure of such Party to comply with any covenant or obligation of such Party; in each case that could reasonably be expected to make the timely satisfaction of any of the conditions set forth in Sections 6, 7 and 8, as applicable, impossible or materially less likely. No notification given to a Party pursuant to this Section 4.5 shall change, limit or otherwise affect any of the representations, warranties, covenants or obligations of the Party providing such notification or any of such Party's Subsidiaries contained in this Agreement or the Company Disclosure Schedule or the Meerkat Disclosure Schedule, as appropriate, for purposes of Section 8.2 or Section 7.1, as appropriate.

Section 5 Additional Agreements of the Parties

5.1 Registration Statement; Proxy Statement.

(a) As promptly as practicable after the date of this Agreement, and in any event no later than 45 days following the date of this Agreement, the Parties shall prepare, and Meerkat shall cause to be filed with the SEC, the Registration Statement, in which the Proxy Statement will be included as a prospectus. Meerkat covenants and agrees that the Proxy Statement (and the letter to stockholders, notice of meeting and form of proxy included therewith) will not contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary in order to make the statements made therein, in light of the circumstances under which they were made, not misleading. The Company covenants and agrees that the information supplied by the Company or its Subsidiaries to Meerkat for inclusion in the Proxy Statement (including the Company Financials) will not contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary in order to make such information not misleading. Notwithstanding the foregoing, Meerkat makes no covenant, representation or warranty with respect to statements made in the Proxy Statement (and the letter to stockholders, notice of meeting and form of proxy included therewith), if any, based on information provided by the Company or its Subsidiaries or any of their Representatives for inclusion therein. Each of the Parties shall use commercially reasonable efforts to cause the Registration Statement and the Proxy Statement to comply with the applicable rules and regulations promulgated by the SEC, to respond promptly to any comments of the SEC or its staff and to have the Registration Statement declared effective under the Securities Act as promptly as practicable after it is filed with the SEC. Each of the Parties shall use commercially reasonable efforts to cause the Proxy Statement to be mailed to Meerkat's stockholders as promptly as practicable after the Registration Statement is declared effective under the Securities Act. Each Party shall promptly furnish to the other Party all information concerning such Party and such Party's Affiliates and such Party's stockholders that may be required or reasonably requested in connection with any action contemplated by this Section 5.1. If Meerkat, Merger Sub or the Company become aware of any event or information that, pursuant to the Securities Act or the Exchange Act, should be disclosed in an amendment or supplement to the Registration Statement or Proxy Statement, as the case may be, then such Party, as the case may be, shall promptly inform the other Parties thereof and shall cooperate with such other Parties in filing such amendment or supplement with the SEC and, if appropriate, in mailing such amendment or supplement to the Meerkat stockholders.

(b) Prior to the Effective Time, Meerkat shall use commercially reasonable efforts to obtain all regulatory approvals needed to ensure that the Meerkat Common Stock to be issued in the Merger (to the extent required) shall be registered or qualified or exempt from registration or qualification under the securities law of every jurisdiction of the United States in which any registered holder of Company Capital Stock has an address of record on the applicable record date for determining the holders of Company Capital Stock entitled to notice of and to vote pursuant to the Company Stockholder Written Consent; provided, however, that Meerkat shall not be required: (i) to qualify to do business as a foreign corporation in any jurisdiction in which it is not now qualified; or (ii) to file a general consent to service of process in any jurisdiction.

(c) The Company shall reasonably cooperate with Meerkat and provide, and require its Representatives to provide, Meerkat and its Representatives, with all true, correct and complete information regarding the Company or its Subsidiaries that is required by law to be included in the Registration Statement or reasonably requested by Meerkat to be included in the Registration Statement.

5.2 Company Stockholder Written Consent.

(a) Promptly after the Registration Statement shall have been declared effective under the Securities Act, and in any event no later than two (2) Business Days thereafter, the Company shall obtain the approval by written consent from Company stockholders sufficient for the Required Company Stockholder Vote in lieu of a meeting pursuant to Section 228 of the DGCL, for purposes of (i) adopting and approving this Agreement and the Contemplated Transactions, (ii) acknowledging that the approval given thereby is irrevocable and that such stockholder is aware of its rights to demand appraisal for its shares pursuant to Section 262 of the DGCL, a copy of which will be attached thereto, and that such stockholder has received and read a copy of Section 262 of the DGCL, and (iii) acknowledging that by its approval of the Merger it is not entitled to appraisal rights with respect to its shares in connection with the Merger and thereby waives any rights to receive payment of the fair value of its capital stock under the DGCL. Under no circumstances shall the Company assert that any other approval or consent is necessary by its stockholders to approve this Agreement and the Contemplated Transactions.

(b) Reasonably promptly following receipt of the Required Company Stockholder Vote, the Company shall prepare and mail a notice (the "***Stockholder Notice***") to every stockholder of the Company that did not execute the Company Stockholder Written Consent. The Stockholder Notice shall (i) be a statement to the effect that the Company Board determined that the Merger is advisable in accordance with Section 251(b) of the DGCL and in the best interests of the stockholders of the Company and approved and adopted this Agreement, the Merger and the other Contemplated Transactions, (ii) provide the stockholders of the Company to whom it is sent with notice of the actions taken in the Company Stockholder Written Consent, including the adoption and approval of this Agreement, the Merger and the other Contemplated Transactions in accordance with Section 228(e) of the DGCL and the certificate of incorporation and bylaws of the Company and (iii) include a description of the appraisal rights of the Company's stockholders available under the DGCL, along with such other information as is required thereunder and pursuant to applicable Law. All materials (including any amendments thereto) submitted to the stockholders of the Company in accordance with this Section 5.2(b) shall be subject to Meerkat's advance review and reasonable approval.

(c) The Company agrees that, subject to Section 5.2(d): (i) the Company Board shall recommend that the Company's stockholders vote to adopt and approve this Agreement and the Contemplated Transactions and shall use commercially reasonable efforts to solicit such approval within the time set forth in Section 5.2(a) (the recommendation of the Company Board that the Company's stockholders vote to adopt and approve this Agreement being referred to as the "***Company Board Recommendation***"); and (ii) the Company Board Recommendation shall not be withdrawn or modified (and the Company Board shall not publicly propose to withdraw or modify the Company Board Recommendation) in a manner adverse to Meerkat, and no resolution by the Company Board or any committee thereof to withdraw or modify the Company Board Recommendation in a manner adverse to Meerkat or to adopt, approve or recommend (or publicly propose to adopt, approve or recommend) any Acquisition Proposal shall be adopted or proposed.

(d) Notwithstanding anything to the contrary contained in Section 5.2(c), and subject to compliance with Section 4.4 and Section 5.2, if at any time prior to approval and adoption of this Agreement by the Required Company Stockholder Vote, (i) the Company receives a bona fide written Superior Offer or (ii) as a result of a material development or change in circumstances (other than any such event, development or change to the extent related to (A) any Acquisition Proposal, Acquisition Inquiry or the consequences thereof or (B) the fact, in and of itself, that the Company meets or exceeds internal budgets, plans or forecasts of its revenues, earnings or other financial performance or results of operations) that affects the business, assets or operations of the Company that occurs or arises after the date of this Agreement (a "***Company Intervening Event***"), the Company Board may withhold, amend, withdraw or modify the Company Board Recommendation (or publicly propose to withhold, amend, withdraw or modify the Company Board Recommendation) in a manner adverse to Meerkat (collectively, a "***Company Board Adverse Recommendation Change***") if, but only if:

(i) in the case of a Superior Offer, (1) the Company Board determines in good faith, based on the advice of its outside legal counsel, that the failure to withhold, amend, withdraw or modify such recommendation would be reasonably likely to be inconsistent with its fiduciary duties under applicable Law, (2) the Company has, and has caused its financial advisors and outside legal counsel to, during the Notice Period (as defined below), negotiate with Meerkat in good faith to make such adjustments to the terms and conditions of this Agreement so that such Acquisition Proposal ceases to constitute a Superior Offer, and (3) if after Meerkat shall have delivered to the Company a written offer to alter the terms or conditions of this Agreement during the Notice Period, the Company Board shall have determined in good faith, based on the advice of its outside legal counsel, that the failure to withhold, amend, withdraw or modify the Company Board Recommendation would result in a breach of its fiduciary duties under applicable Law (after taking into account such alterations of the terms and conditions of this Agreement); *provided* that (x) Meerkat receives written notice from the Company confirming that the Company Board has determined to change its recommendation at least four Business Days in advance of the Company Board Adverse Recommendation Change (the "***Notice Period***"), which notice shall include a description in reasonable detail of the reasons for such Company Board Adverse Recommendation Change, and written copies of any relevant proposed transaction agreements with any party making a potential Superior Offer; (y) during any Notice Period, Meerkat shall be entitled to deliver to the Company one or more counterproposals to such Acquisition Proposal and the Company will, and cause its Representatives to, negotiate with Meerkat in good faith (to the extent Meerkat desires to negotiate) to make such adjustments in the terms and conditions of this Agreement so that the applicable Acquisition Proposal ceases to constitute a Superior Offer; and (z) in the event of any material amendment to any Superior Offer (including any revision in the amount, form or mix of consideration the Company's stockholders would receive as a result of such potential Superior Offer), the Company shall be required to provide Meerkat with notice of such material amendment and the Notice Period shall be extended, if applicable, to ensure that at least two (2) Business Days remain in the Notice Period following such notification during which the parties shall comply again with the requirements of this Section 5.2(d) and the Company Board shall not make a Company Board Adverse Recommendation Change prior to the end of such Notice Period as so extended (it being understood that there may be multiple extensions); or

(ii) in the case of a Company Intervening Event, the Company promptly notifies Meerkat, in writing, within the Notice Period before making a Company Board Adverse Recommendation Change, which notice shall state expressly the material facts and circumstances related to the applicable Company Intervening Event and that the Company Board intends to make a Company Board Adverse Recommendation Change.

(e) The Company's obligation to solicit the consent of its stockholders to sign the Company Stockholder Written Consent in accordance with Section 5.2(a) shall not be limited or otherwise affected by the commencement, disclosure, announcement or submission of any Superior Offer or other Acquisition Proposal, or by any Company Board Adverse Recommendation Change.

5.3 Meerkat Stockholders' Meeting.

(a) Meerkat shall take all action necessary under applicable Law to call, give notice of and hold a meeting of the holders of Meerkat Common Stock to consider and vote to approve this Agreement and the Contemplated Transactions, including the issuance of the shares of Meerkat Common Stock to the stockholders of the Company pursuant to the terms of this Agreement and, if deemed necessary by the Parties, an amendment to Meerkat's certificate of incorporation to effect the Meerkat Reverse Stock Split (collectively, the "***Meerkat Stockholder Matters***" and such meeting, the "***Meerkat Stockholders' Meeting***"). The Meerkat Stockholders' Meeting shall be held as promptly as practicable after the Registration Statement is declared effective under the Securities Act, and in any event no later than forty-five (45) days after the effective date of the Registration Statement. Meerkat shall take reasonable measures to ensure that all proxies solicited in connection with the Meerkat Stockholders' Meeting are solicited in compliance with all applicable Law.

(b) Meerkat agrees that, subject to Section 5.3(c): (i) the Meerkat Board shall recommend that the holders of Meerkat Common Stock vote to approve the Meerkat Stockholder Matters and shall use commercially reasonable efforts to solicit such approval within the timeframe set forth in Section 5.3(a) above, (ii) the Proxy Statement shall include a statement to the effect that the Meerkat Board recommends that Meerkat's stockholders vote to approve the Meerkat Stockholder Matters (the recommendation of the Meerkat Board being referred to as the "***Meerkat Board Recommendation***"); and (iii) the Meerkat Board Recommendation shall not be withheld, amended, withdrawn or modified (and the Meerkat Board shall not publicly propose to withhold, amend, withdraw or modify the Meerkat Board Recommendation) in a manner adverse to the Company, and no resolution by the Meerkat Board or any committee thereof to withdraw or modify the Meerkat Board Recommendation in a manner adverse to the Company or to adopt, approve or recommend (or publicly propose to adopt, approve or recommend) any Acquisition Proposal shall be adopted or proposed (the actions set forth in the foregoing clause (iii), collectively, a "***Meerkat Board Adverse Recommendation Change***").

(c) Notwithstanding anything to the contrary contained in Section 5.3(b), and subject to compliance with Section 4.4 and Section 5.3, if at any time prior to approval of the Meerkat Stockholder Matters by the Required Meerkat Stockholder Vote, (i) Meerkat receives a bona fide written Superior Offer or (ii) as a result of a material development or change in circumstances (other than any such event, development or change to the extent related to (A) any Acquisition Proposal, Acquisition Inquiry or the consequences thereof or (B) the fact, in and of itself, that Meerkat meets or exceeds internal budgets, plans or forecasts of its revenues, earnings or other financial performance or results of operations) that affects the business, assets or operations of Meerkat that occurs or arises after the date of this Agreement (a "***Meerkat Intervening Event***"), the Meerkat Board may make a Meerkat Board Adverse Recommendation Change if, but only if:

(i) in the case of a Superior Offer, (1) the Meerkat Board determines in good faith, based on the advice of its outside legal counsel, that the failure to make a Meerkat Board Adverse Recommendation Change would be reasonably likely to be inconsistent with its fiduciary duties under applicable Law, (2) Meerkat has, and has caused its financial advisors and outside legal counsel to, during the Notice Period, negotiate with the Company in good faith to make such adjustments to the terms and conditions of this Agreement so that such Acquisition Proposal ceases to constitute a Superior Offer, and (3) if after the Company shall have delivered to Meerkat a written offer to alter the terms or conditions of this Agreement during the Notice Period, the Meerkat Board shall have determined in good faith, based on the advice of its outside legal counsel, that the failure to withhold, amend, withdraw or modify the Meerkat Board Recommendation would result in a breach of its fiduciary duties under applicable Law (after taking into account such alterations of the terms and conditions of this Agreement); *provided* that (x) the Company receives written notice from Meerkat confirming that the Meerkat Board has determined to change its recommendation during the Notice Period, which notice shall include a description in reasonable detail of the reasons for such Meerkat Board Adverse Recommendation Change, and written copies of any relevant proposed transaction agreements with any party making a potential Superior Offer; (y) during any Notice Period, the Company shall be entitled to deliver to Meerkat one or more counterproposals to such Acquisition Proposal and Meerkat will, and cause its Representatives to, negotiate with the Company in good faith (to the extent the Company desires to negotiate) to make such adjustments in the

terms and conditions of this Agreement so that the applicable Acquisition Proposal ceases to constitute a Superior Offer; and (z) in the event of any material amendment to any Superior Offer (including any revision in price or percentage of the combined company that Meerkat's stockholders would receive as a result of such potential Superior Offer), Meerkat shall be required to provide the Company with notice of such material amendment and the Notice Period shall be extended, if applicable, to ensure that at least two (2) Business Days remain in the Notice Period following such notification during which the parties shall comply again with the requirements of this Section 5.3(c) and the Meerkat Board shall not make a Meerkat Board Adverse Recommendation Change prior to the end of such Notice Period as so extended (it being understood that there may be multiple extensions); or

(ii) in the case of a Meerkat Intervening Event, Meerkat promptly notifies the Company, in writing, within the Notice Period before making a Meerkat Board Adverse Recommendation Change, which notice shall state expressly the material facts and circumstances related to the applicable Meerkat Intervening Event and that the Meerkat Board intends to make a Meerkat Board Adverse Recommendation Change.

(d) Meerkat's obligation to call, give notice of and hold the Meerkat Stockholders' Meeting in accordance with Section 5.3(a) shall not be limited or otherwise affected by the commencement, disclosure, announcement or submission of any Superior Offer or Acquisition Proposal, or by any withdrawal or modification of the Meerkat Board Recommendation.

(e) Nothing contained in this Agreement shall prohibit Meerkat or the Meerkat Board from complying with Rules 14d-9 and 14e-2(a) promulgated under the Exchange Act; *provided however*, that any disclosure made by Meerkat or the Meerkat Board pursuant to Rules 14d-9 and 14e-2(a) shall be limited to a statement that Meerkat is unable to take a position with respect to the bidder's tender offer unless the Meerkat Board determines in good faith, after consultation with its outside legal counsel, that such statement would result in a breach of its fiduciary duties under applicable Law. Meerkat shall not withdraw or modify in a manner adverse to the Company the Meerkat Board Recommendation unless specifically permitted pursuant to the terms of Section 5.3(c).

5.4 Regulatory Approvals. Each Party shall use commercially reasonable efforts to file or otherwise submit, as soon as practicable after the date of this Agreement, all applications, notices, reports and other documents reasonably required to be filed by such Party with or otherwise submitted by such Party to any Governmental Body with respect to the Contemplated Transactions, and to submit promptly any additional information requested by any such Governmental Body. Without limiting the generality of the foregoing, the Parties shall, promptly after the date of this Agreement, prepare and file, if any, (a) the notification and report forms required to be filed under the HSR Act and (b) any notification or other document required to be filed in connection with the Merger under any applicable foreign Law relating to antitrust or competition matters. The Company and Meerkat shall respond as promptly as is practicable to respond in compliance with: (i) any inquiries or requests received from the Federal Trade Commission or the Department of Justice for additional information or documentation; and (ii) any inquiries or requests received from any state attorney general, foreign antitrust or competition authority or other Governmental Body in connection with antitrust or competition matters.

5.5 Company Options.

(a) Subject to Section 5.5(c), at the Effective Time, each Company Option that is outstanding and unexercised immediately prior to the Effective Time under the Company Plan, whether or not vested, shall be converted into and become an option to purchase Meerkat Common Stock, and Meerkat shall assume the Company Plan and each such Company Option in accordance with the terms (as in effect as of the date of this Agreement) of the Company Plan and the terms of the stock option agreement by which such Company Option is evidenced. Any Company Options not issued under the Company Plan shall be cancelled immediately prior to the Effective Time. All rights with respect to Company Common Stock under Company Options assumed by Meerkat shall thereupon be converted into rights with respect to Meerkat Common Stock. Accordingly, from and

after the Effective Time: (i) each Company Option assumed by Meerkat may be exercised solely for shares of Meerkat Common Stock; (ii) the number of shares of Meerkat Common Stock subject to each Company Option assumed by Meerkat shall be determined by multiplying (A) the number of shares of Company Common Stock that were subject to such Company Option, as in effect immediately prior to the Effective Time, by (B) the Exchange Ratio, and rounding the resulting number down to the nearest whole number of shares of Meerkat Common Stock; (iii) the per share exercise price for the Meerkat Common Stock issuable upon exercise of each Company Option assumed by Meerkat shall be determined by dividing (A) the per share exercise price of Company Common Stock subject to such Company Option, as in effect immediately prior to the Effective Time, by (B) the Exchange Ratio and rounding the resulting exercise price up to the nearest whole cent; and (iv) any restriction on the exercise of any Company Option assumed by Meerkat shall continue in full force and effect and the term, exercisability, vesting schedule and other provisions of such Company Option shall otherwise remain unchanged; *provided, however*, that: (A) to the extent provided under the terms of a Company Option, such Company Option assumed by Meerkat in accordance with this Section 5.5(a) shall, in accordance with its terms, be subject to further adjustment as appropriate to reflect any stock split, division or subdivision of shares, stock dividend, reverse stock split, consolidation of shares, reclassification, recapitalization or other similar transaction with respect to Meerkat Common Stock subsequent to the Effective Time; and (B) the Meerkat Board or a committee thereof shall succeed to the authority and responsibility of the Company Board or any committee thereof with respect to each Company Option assumed by Meerkat. Notwithstanding anything to the contrary in this Section 5.5(a), the conversion of each Company Option (regardless of whether such option qualifies as an "incentive stock option" within the meaning of Section 422 of the Code) into an option to purchase shares of Meerkat Common Stock shall be made in a manner consistent with Treasury Regulation Section 1.424-1, such that the conversion of a Company Option shall not constitute a "modification" of such Company Option for purposes of Section 409A or Section 424 of the Code.

(b) Meerkat shall file with the SEC, promptly after the Effective Time, a registration statement on Form S-8 relating to the shares of Meerkat Common Stock issuable with respect to Company Options assumed by Meerkat in accordance with Section 5.5(a).

(c) Prior to the Effective Time, the Company shall take all actions that may be necessary (under the Company Plan and otherwise) to effectuate the provisions of this Section 5.5 and to ensure that, from and after the Effective Time, holders of Company Options have no rights with respect thereto other than those specifically provided in this Section 5.5.

5.6 Meerkat Options.

(a) Prior to the Closing, the Meerkat Board shall have adopted appropriate resolutions and taken all other actions necessary and appropriate to provide that each unexpired and unexercised Meerkat Option, whether vested or unvested, shall be accelerated in full effective as of immediately prior to the Effective Time. Effective as of the Effective Time, each outstanding and unexercised Meerkat Option having an exercise price per share less than the Meerkat Closing Price shall be automatically exercised in full and, in exchange therefor, each former holder of any such automatically exercised Meerkat Option shall be entitled to receive a number of shares of Meerkat Common Stock calculated by dividing (a) the product of (i) the total number of shares of Meerkat Common Stock previously subject to such Meerkat Option, and (ii) the excess of the Meerkat Closing Price over the exercise price per share of the Meerkat Common Stock previously subject to such Meerkat Option by (b) the Meerkat Closing Price. Notwithstanding anything herein to the contrary, the tax withholding obligations for each holder receiving shares of Meerkat Common Stock in accordance with the preceding sentence shall be satisfied by Meerkat withholding from issuance that number of shares of Meerkat Common Stock calculated by multiplying the maximum statutory withholding rate for such holder in connection with such issuance by the number of shares of Meerkat Common Stock to be issued in accordance with the preceding sentence, and rounding up to the nearest whole share. Each outstanding and unexercised Meerkat Option that has an exercise price equal to or greater than the Meerkat Closing Price shall be terminated and cease to exist as of immediately prior to the Effective Time for no consideration.

(b) Prior to the Effective Time, Meerkat shall take all actions that may be necessary (under the Meerkat Stock Plans and otherwise) to effectuate the provisions of this Section 5.6 and to ensure that, from and after the Effective Time, holders of Meerkat Options have no rights with respect thereto other than those specifically provided in this Section 5.6.

5.7 Employee Benefits. Meerkat and the Company shall cause Meerkat to comply with the terms of any employment, severance, retention, change of control, or similar agreement specified on Section 3.17(c) of the Meerkat Disclosure Schedule, subject to the provisions of such agreements.

5.8 Indemnification of Officers and Directors.

(a) From the Effective Time through the sixth anniversary of the date on which the Effective Time occurs, each of Meerkat and the Surviving Corporation shall indemnify and hold harmless each person who is now, or has been at any time prior to the date hereof, or who becomes prior to the Effective Time, a director or officer of Meerkat or the Company, respectively (the "***D&O Indemnified Parties***"), against all claims, losses, liabilities, damages, judgments, fines and reasonable fees, costs and expenses, including attorneys' fees and disbursements (collectively, "***Costs***"), incurred in connection with any claim, action, suit, proceeding or investigation, whether civil, criminal, administrative or investigative, arising out of or pertaining to the fact that the D&O Indemnified Party is or was a director or officer of Meerkat or of the Company, whether asserted or claimed prior to, at or after the Effective Time, in each case, to the fullest extent permitted under the DGCL for directors or officers of Delaware corporations. Each D&O Indemnified Party will be entitled to advancement of expenses incurred in the defense of any such claim, action, suit, proceeding or investigation from each of Meerkat and the Surviving Corporation, jointly and severally, upon receipt by Meerkat or the Surviving Corporation from the D&O Indemnified Party of a request therefor; *provided* that any such person to whom expenses are advanced provides an undertaking to Meerkat, to the extent then required by the DGCL, to repay such advances if it is ultimately determined that such person is not entitled to indemnification.

(b) The provisions of the certificate of incorporation and bylaws of Meerkat with respect to indemnification, advancement of expenses and exculpation of present and former directors and officers of Meerkat that are presently set forth in the certificate of incorporation and bylaws of Meerkat shall not be amended, modified or repealed for a period of six years from the Effective Time in a manner that would adversely affect the rights thereunder of individuals who, at or prior to the Effective Time, were officers or directors of Meerkat, unless such modification is required by applicable Law. The certificate of incorporation and bylaws of the Surviving Corporation shall contain, and Meerkat shall cause the certificate of incorporation and bylaws of the Surviving Corporation to so contain, provisions no less favorable with respect to indemnification, advancement of expenses and exculpation of present and former directors and officers as those presently set forth in the certificate of incorporation and bylaws of Meerkat.

(c) From and after the Effective Time, (i) the Surviving Corporation shall fulfill and honor in all respects the obligations of the Company to its D&O Indemnified Parties as of immediately prior to the Closing pursuant to any indemnification provisions under the Company's Organizational Documents and pursuant to any indemnification agreements between the Company and such D&O Indemnified Parties, with respect to claims arising out of matters occurring at or prior to the Effective Time and (ii) Meerkat shall fulfill and honor in all respects the obligations of Meerkat to its D&O Indemnified Parties as of immediately prior to the Closing pursuant to any indemnification provisions under Meerkat's Organizational Documents and pursuant to any indemnification agreements between Meerkat and such D&O Indemnified Parties, with respect to claims arising out of matters occurring at or prior to the Effective Time.

(d) From and after the Effective Time, Meerkat shall maintain directors' and officers' liability insurance policies, with an effective date as of the Closing Date, on commercially available terms and conditions and with coverage limits customary for U.S. public companies similarly situated to Meerkat. In addition, Meerkat shall purchase, prior to the Effective Time, a six-year prepaid "D&O tail policy" for the non-cancellable

extension of the directors' and officers' liability coverage of Meerkat's existing directors' and officers' insurance policies and Meerkat's existing fiduciary liability insurance policies, in each case, for a claims reporting or discovery period of at least six years from and after the Effective Time with respect to any wrongful act related to any period of time at or prior to the Effective Time with terms, conditions, retentions and limits of liability that are no less favorable than the coverage provided under Meerkat's existing policies as of the date of this Agreement with respect to any actual or alleged error, misstatement, misleading statement, act, omission, neglect, breach of duty or any matter claimed against a director or officer of Meerkat by reason of him or her serving in such capacity that existed or occurred at or prior to the Effective Time (including in connection with this Agreement or the Contemplated Transactions or in connection with Meerkat's initial public offering of shares of Meerkat Common Stock). Additionally, Meerkat shall allow the Company to add itself and its Subsidiaries as additional insureds solely in their capacity as Meerkat's successors in interest on the D&O tail policy on Meerkat's behalf.

(e) From and after the Effective Time, Meerkat shall pay all expenses, including reasonable attorneys' fees, that are incurred by the persons referred to in this Section 5.8 in connection with their enforcement of the rights provided to such persons in this Section 5.8.

(f) The provisions of this Section 5.8 are intended to be in addition to the rights otherwise available to the current and former officers and directors of Meerkat and the Company by law, charter, statute, bylaw or agreement, and shall operate for the benefit of, and shall be enforceable by, each of the D&O Indemnified Parties, their heirs and their representatives.

(g) In the event Meerkat or the Surviving Corporation or any of their respective successors or assigns (i) consolidates with or merges into any other Person and shall not be the continuing or surviving corporation or entity of such consolidation or merger, or (ii) transfers all or substantially all of its properties and assets to any Person, then, and in each such case, proper provision shall be made so that the successors and assigns of Meerkat or the Surviving Corporation, as the case may be, shall succeed to the obligations set forth in this Section 5.8. Meerkat shall cause the Surviving Corporation to perform all of the obligations of the Surviving Corporation under this Section 5.8.

(h) Meerkat shall purchase, prior to the Effective Time, a six-year prepaid "Clinical Trial tail policy" for the non-cancellable extension of Meerkat's existing U.S. clinical trial insurance policies and shall use commercially reasonable efforts to purchase a six-year prepaid "Clinical Trial tail policy" for the non-cancellable extension of Meerkat's existing clinical trial insurance policies in jurisdictions other than the U.S. where Meerkat has conducted clinical trials and where such coverage is available by Law and on commercially reasonable terms, in each case, for a claims reporting or discovery period of at least six years from and after the Effective Time with respect to any claim related to any period of time at or prior to the Effective Time with terms, conditions, retentions and limits of liability that are no less favorable than the coverage provided under Meerkat's existing policies as of the date of this Agreement; provided, that Meerkat shall not be required to pay an annual premium for any such extension of such policy in any given jurisdiction in excess of 200% of the last annual premium paid for such policy prior to the date of this Agreement.

5.9 Additional Agreements. The Parties shall use commercially reasonable efforts to cause to be taken all actions necessary to consummate the Contemplated Transactions. Without limiting the generality of the foregoing, each Party to this Agreement: (a) shall make all filings and other submissions (if any) and give all notices (if any) required to be made and given by such Party in connection with the Contemplated Transactions; (b) shall use commercially reasonable efforts to obtain each Consent (if any) reasonably required to be obtained (pursuant to any applicable Law or Contract, or otherwise) by such Party in connection with the Contemplated Transactions or for such Contract to remain in full force and effect; (c) shall use commercially reasonable efforts to lift any injunction prohibiting, or any other legal bar to, the Contemplated Transactions; and (d) shall use commercially reasonable efforts to satisfy the conditions precedent to the consummation of this Agreement.

5.10 Disclosure. Without limiting any Party's obligations under the Confidentiality Agreement, no Party shall, and no Party shall permit any of its Subsidiaries or any Representative of such Party to, issue any press

release or make any disclosure (to any customers or employees of such Party, to the public or otherwise) regarding the Contemplated Transactions unless: (a) the other Party shall have approved such press release or disclosure in writing, such approval not to be unreasonably conditioned, withheld or delayed; or (b) such Party shall have determined in good faith, upon the advice of outside legal counsel, that such disclosure is required by applicable Law and, to the extent practicable, before such press release or disclosure is issued or made, such Party advises the other Party of, and consults with the other Party regarding, the text of such press release or disclosure; *provided*, *however*, that each of the Company and Meerkat may make any public statement in response to specific questions by the press, analysts, investors or those attending industry conferences or financial analyst conference calls, so long as any such statements are consistent with previous press releases, public disclosures or public statements made by the Company or Meerkat in compliance with this Section 5.10.

5.11 Listing. Meerkat shall use its commercially reasonable efforts: (a) to maintain its existing listing on the NASDAQ Global Market until the Closing Date and to obtain approval of the listing of the combined company on the NASDAQ Global Market; (b) without derogating from the generality of the requirements of clause "(a)" and to the extent required by the rules and regulations of NASDAQ, to (i) prepare and submit to NASDAQ a notification form for the listing of the shares of Meerkat Common Stock to be issued in connection with the Contemplated Transactions and (ii) to cause such shares to be approved for listing (subject to official notice of issuance); and (c) to the extent required by Nasdaq Marketplace Rule 5110, to file an initial listing application for the Meerkat Common Stock on NASDAQ (the "***Nasdaq Listing Application***") and to cause such Nasdaq Listing Application to be conditionally approved prior to the Effective Time. The Company will cooperate with Meerkat as reasonably requested by Meerkat with respect to the Nasdaq Listing Application and promptly furnish to Meerkat all information concerning the Company and its stockholders that may be required or reasonably requested in connection with any action contemplated by this Section 5.11.

5.12 Tax Matters. The Parties shall use their respective commercially reasonable efforts to cause the Merger to qualify, and will not take any action or cause any action to be taken which action would reasonably be expected to prevent the Merger from qualifying, as a reorganization within the meaning of Section 368(a) of the Code. The Parties shall not file any U.S. federal, state or local Tax Return in a manner that is inconsistent with the treatment of the Merger as a reorganization within the meaning of Section 368(a) of the Code for U.S. federal, state and other relevant Tax purposes, unless otherwise required by applicable Law.

5.13 Legends. Meerkat shall be entitled to place appropriate legends on the book entries and/or certificates evidencing any shares of Meerkat Common Stock to be received in the Merger by equityholders of the Company who may be considered "affiliates" of Meerkat for purposes of Rules 144 and 145 under the Securities Act reflecting the restrictions set forth in Rules 144 and 145 and to issue appropriate stop transfer instructions to the transfer agent for Meerkat Common Stock.

5.14 [Reserved]

5.15 Directors and Officers. Until successors are duly elected or appointed and qualified in accordance with applicable Law, the Parties shall use reasonable best efforts and take all necessary action so that the Persons listed in Schedule 5.15 are elected or appointed, as applicable, to the positions of officers and directors of Meerkat and the Surviving Corporation, as set forth therein, to serve in such positions effective as of the Effective Time. If any Person listed in Schedule 5.15 is unable or unwilling to serve as officer or director of Meerkat or the Surviving Corporation, as set forth therein, the Party appointing such Person (as set forth on Schedule 5.15) shall designate a successor.

5.16 [Reserved]

5.17 Corporate Identity. Meerkat shall submit to its stockholders at the Meerkat Stockholders' Meeting a proposal to approve and adopt an amendment to Meerkat's certificate of incorporation to change the name of Meerkat to "Synlogic, Inc.", contingent upon the Effective Time.

5.18 Section 16 Matters. Prior to the Effective Time, Meerkat shall take all such steps as may be required to cause any acquisitions of Meerkat Common Stock and any options to purchase Meerkat Common Stock in connection with the Contemplated Transactions, by each individual who is reasonably expected to become subject to the reporting requirements of Section 16(a) of the Exchange Act with respect to Meerkat, to be exempt under Rule 16b-3 promulgated under the Exchange Act.

5.19 Cooperation. Each Party shall cooperate reasonably with the other Party and shall provide the other Party with such assistance as may be reasonably requested for the purpose of facilitating the performance by each Party of its respective obligations under this Agreement and to enable the combined entity to continue to meet its obligations following the Effective Time.

5.20 Allocation Certificate. The Company will prepare and deliver to Meerkat at least two Business Days prior to the Closing Date a certificate signed by the Chief Financial Officer of the Company in a form reasonably acceptable to Meerkat setting forth (as of immediately prior to the Effective Time) (a) each holder of Company Capital Stock or Company Options, (b) such holder's name and address; (c) the number and type of Company Capital Stock held and/or underlying the Company Options as of the Closing Date for each such holder; and (d) the number of shares of Meerkat Common Stock to be issued to such holder, or to underlie any Meerkat Option to be issued to such holder, pursuant to this Agreement in respect of the Company Capital Stock or Company Options held by such holder as of immediately prior to the Effective Time (the "***Allocation Certificate***").

5.21 Company Financial Statements. As promptly as reasonably practicable following the date of this Agreement (and in any event within thirty (30) days following the date of this Agreement with respect to the Company Audited Financial Statements), the Company will cause its independent auditors to furnish (i) audited financial statements for the fiscal year ended December 31, 2016, and December 31, 2015, for inclusion in the Proxy Statement and the Registration Statement (the "***Company Audited Financial Statements***") and (ii) unaudited interim financial statements for each interim period completed prior to Closing that would be required to be included in the Registration Statement or any periodic report due prior to the Closing if the Company were subject to the periodic reporting requirements under the Securities Act or the Exchange Act (the "***Company Interim Financial Statements***"). Each of the Company Audited Financial Statements and the Company Interim Financial Statements will be suitable for inclusion in the Proxy Statement and the Registration Statement and prepared in accordance with GAAP as applied on a consistent basis during the periods involved (except in each case as described in the notes thereto) and on that basis will present fairly, in all material respects, the financial position and the results of operations, changes in stockholders' equity, and cash flows of the Company as of the dates of and for the periods referred to in the Company Audited Financial Statements or the Company Interim Financial Statements, as the case may be.

5.22 Meerkat Reverse Stock Split. If deemed necessary by the Parties, Meerkat shall submit to Meerkat's stockholders at the Meerkat Stockholders' Meeting an amendment to Meerkat's certificate of incorporation to authorize the Meerkat Board to effect a reverse stock split of all outstanding shares of Meerkat Common Stock at a reverse stock split ratio mutually agreed to by the Company and Meerkat (the "***Meerkat Reverse Stock Split***"), and shall take such other actions as shall be reasonably necessary to effectuate the Meerkat Reverse Stock Split.

5.23 Termination of Contracts. Meerkat agrees to use commercially reasonable efforts to (a) terminate, assign or fully perform all Meerkat Contracts (other than the Meerkat Contracts listed on Schedule 5.23 or any other Meerkat Contract that Meerkat and the Company agree shall not be subject to this Section 5.23) and (b) fully satisfy, waive or otherwise discharge all obligations of Meerkat under all Meerkat Contracts (other than the Meerkat Contracts listed on Schedule 5.23 or any other Meerkat Contract that Meerkat and the Company agree shall not be subject to this Section 5.23), in each case prior to the Closing.

Section 6 Conditions Precedent to Obligations of Each Party

The obligations of each Party to effect the Merger and otherwise consummate the Contemplated Transactions to be consummated at the Closing are subject to the satisfaction or, to the extent permitted by applicable law, the written waiver by each of the Parties, at or prior to the Closing, of each of the following conditions:

6.1 Effectiveness of Registration Statement. The Registration Statement shall have become effective in accordance with the provisions of the Securities Act, and shall not be subject to any stop order or proceeding (or threatened proceeding by the SEC) seeking a stop order with respect to the Registration Statement.

6.2 No Restraints. No temporary restraining order, preliminary or permanent injunction or other order preventing the consummation of the Contemplated Transactions shall have been issued by any court of competent jurisdiction or other Governmental Body of competent jurisdiction and remain in effect and there shall not be any Law which has the effect of making the consummation of the Contemplated Transactions illegal.

6.3 Stockholder Approval. (a) Meerkat shall have obtained the Required Meerkat Stockholder Vote and (b) the Company shall have obtained the Required Company Stockholder Vote.

6.4 Listing. The existing shares of Meerkat Common Stock shall have been continually listed on the NASDAQ Global Market as of and from the date of this Agreement through the Closing Date, the approval of the listing of the additional shares of Meerkat Common Stock on the NASDAQ Global Market shall have been obtained and the shares of Meerkat Common Stock to be issued in the Merger pursuant to this Agreement shall have been approved for listing (subject to official notice of issuance) on the NASDAQ Global Market or such other NASDAQ market on which shares of Meerkat Common Stock are then listed.

6.5 Regulatory Matters. Any waiting period applicable to the consummation of the Merger under the HSR Act shall have expired or been terminated.

6.6 No Governmental Proceedings Relating to Contemplated Transactions or Right to Operate Business. There shall not be any Legal Proceeding pending, or overtly threatened in writing by an official of a Governmental Body in which such Governmental Body indicates that it intends to conduct any Legal Proceeding: (a) challenging or seeking to restrain or prohibit the consummation of the Merger; (b) relating to the Merger and seeking to obtain from Meerkat, Merger Sub or the Company any damages or other relief that may be material to Meerkat or the Company; (c) seeking to prohibit or limit in any material and adverse respect a Party's ability to vote, transfer, receive dividends with respect to or otherwise exercise ownership rights with respect to the stock of Meerkat; (d) that would materially and adversely affect the right or ability of Meerkat or the Company to own the assets or operate the business of Meerkat or the Company; or (e) seeking to compel Meerkat, the Company or any Subsidiary of the Company to dispose of or hold separate any material assets as a result of the Merger.

Section 7 Additional Conditions Precedent to Obligations of Meerkat and Merger Sub

The obligations of Meerkat and Merger Sub to effect the Merger and otherwise consummate the transactions to be consummated at the Closing are subject to the satisfaction or the written waiver by Meerkat, at or prior to the Closing, of each of the following conditions:

7.1 Accuracy of Representations. The Company Fundamental Representations shall have been true and correct in all respects as of the date of this Agreement and shall be true and correct on and as of the Closing Date with the same force and effect as if made on and as of such date (except to the extent such representations and warranties are specifically made as of a particular date, in which case such representations and warranties shall be true and correct as of such date). The Company Capitalization Representations shall have been true and correct in all respects as of the date of this Agreement and shall be true and correct on and as of the Closing Date with the same force and effect as if made on and as of such date, except, in each case, (x) for such inaccuracies

which are *de minimis*, individually or in the aggregate or (y) for those representations and warranties which address matters only as of a particular date (which representations and warranties shall have been true and correct, subject to the qualifications as set forth in the preceding clause (x), as of such particular date). The representations and warranties of the Company contained in this Agreement (other than the Company Fundamental Representations and the Company Capitalization Representations) shall have been true and correct as of the date of this Agreement and shall be true and correct on and as of the Closing Date with the same force and effect as if made on the Closing Date except (a) in each case, or in the aggregate, where the failure to be so true and correct would not reasonably be expected to have a Company Material Adverse Effect (without giving effect to any references therein to any Company Material Adverse Effect or other materiality qualifications), or (b) for those representations and warranties which address matters only as of a particular date (which representations shall have been true and correct, subject to the qualifications as set forth in the preceding clause (a), as of such particular date) (it being understood that, for purposes of determining the accuracy of such representations and warranties, any update of or modification to the Company Disclosure Schedule made or purported to have been made after the date of this Agreement shall be disregarded).

7.2 Performance of Covenants. The Company shall have performed or complied with in all material respects all agreements and covenants required to be performed or complied with by it under this Agreement at or prior to the Effective Time.

7.3 Closing Certificate. Meerkat shall have received a certificate executed by the Chief Executive Officer or Chief Financial Officer of the Company certifying (a) that the conditions set forth in Sections 7.1, 7.2, and 7.6 have been duly satisfied and (b) that the information set forth in the Allocation Certificate delivered by the Company in accordance with Section 5.20 is true and accurate in all respects as of the Closing Date.

7.4 [Reserved].

7.5 FIRPTA Certificate. Meerkat shall have received from the Company a form of notice to the IRS in accordance with the requirements of Treasury Regulation Section 1.897-2(h) and in form and substance reasonably acceptable to Meerkat.

7.6 No Company Material Adverse Effect. Since the date of this Agreement, there shall not have occurred any Company Material Adverse Effect.

7.7 Other Deliveries. Meerkat shall have received: (a) certificates of good standing of the Company in its jurisdiction of organization and the various foreign jurisdictions in which it is qualified, (b) certified charter documents, and (c) certificates as to the incumbency of officers and the adoption of authorizing resolutions.

7.8 Company Lock-Up Agreements. The Company Lock-up Agreements will continue to be in full force and effect as of immediately following the Effective Time.

Section 8 Additional Conditions Precedent to Obligation of the Company

The obligations of the Company to effect the Merger and otherwise consummate the transactions to be consummated at the Closing are subject to the satisfaction or the written wavier by the Company, at or prior to the Closing, of each of the following conditions:

8.1 Accuracy of Representations. Each of the Meerkat Fundamental Representations shall have been true and correct in all respects as of the date of this Agreement and shall be true and correct on and as of the Closing Date with the same force and effect as if made on and as of such date (except to the extent such representations and warranties are specifically made as of a particular date, in which case such representations and warranties shall be true and correct as of such date). The Meerkat Capitalization Representations shall have been true and correct as of the date of this Agreement and shall be true and correct on and as of the Closing Date with the same

force and effect as if made on and as of such date, except, in each case, (x) for such inaccuracies which are *de minimis*, individually or in the aggregate or (y) for those representations and warranties which address matters only as of a particular date (which representations and warranties shall have been true and correct, subject to the qualifications as set forth in the preceding clause (x), as of such particular date). The representations and warranties of Meerkat and Merger Sub contained in this Agreement (other than the Meerkat Fundamental Representations and the Meerkat Capitalization Representations) shall have been true and correct as of the date of this Agreement and shall be true and correct on and as of the Closing Date with the same force and effect as if made on the Closing Date except (a) in each case, or in the aggregate, where the failure to be true and correct would not reasonably be expected to have a Meerkat Material Adverse Effect (without giving effect to any references therein to any Meerkat Material Adverse Effect or other materiality qualifications), or (b) for those representations and warranties which address matters only as of a particular date (which representations shall have been true and correct, subject to the qualifications as set forth in the preceding clause (a), as of such particular date) (it being understood that, for purposes of determining the accuracy of such representations and warranties, any update of or modification to the Meerkat Disclosure Schedule made or purported to have been made after the date of this Agreement shall be disregarded).

8.2 Performance of Covenants. Meerkat and Merger Sub shall have performed or complied with in all material respects all of their agreements and covenants required to be performed or complied with by each of them under this Agreement at or prior to the Effective Time.

8.3 Documents. The Company shall have received the following documents, each of which shall be in full force and effect:

(a) a certificate executed by the Chief Executive Officer or Chief Financial Officer of Meerkat confirming that the conditions set forth in Sections 8.1, 8.2, and 8.5 have been duly satisfied; and

(b) written resignations in forms satisfactory to the Company, dated as of the Closing Date and effective as of the Closing executed by the officers and directors of Meerkat who are not to continue as officers or directors of Meerkat pursuant to Section 5.15 hereof.

8.4 Sarbanes-Oxley Certifications. Neither the principal executive officer nor the principal financial officer of Meerkat shall have failed to provide, with respect to any Meerkat SEC Document filed (or required to be filed) with the SEC on or after the date of this Agreement, any necessary certification in the form required under Rule 13a-14 under the Exchange Act and 18 U.S.C. §1350.

8.5 No Meerkat Material Adverse Effect. Since the date of this Agreement, there shall not have occurred any Meerkat Material Adverse Effect.

8.6 Minimum Cash. Net Cash determined in accordance with Section 1.6 shall be greater than or equal to $33,500,000 (the "***Net Cash Condition***").

8.7 Board of Directors. Meerkat shall have caused the Meerkat Board to be constituted as set forth in Section 5.15 of this Agreement effective as of the Effective Time.

8.8 Termination of Contracts. The Company shall have received evidence, in form and substance reasonably satisfactory to it, that the Meerkat Contracts set forth on Schedule 8.8 have been (a) terminated, assigned, or fully performed by Meerkat and (b) all obligations of Meerkat thereunder have been fully satisfied, waived or otherwise discharged (except as otherwise set forth on Schedule 8.8).

8.9 CPRIT Matters. The agreements set forth on Schedule A shall be in effect and shall not have been amended (without the Company's prior written consent) prior to the Closing Date.

8.10 Other Deliveries. The Company shall have received (a) certificates of good standing of Meerkat in its jurisdiction of organization and the various foreign jurisdictions in which it is qualified, (b) certified charter

documents, and (c) certificates as to the incumbency of officers and the adoption of authorizing resolutions) as it will reasonably request in connection with the closing of the transactions contemplated by this Agreement.

8.11 Meerkat Lock-Up Agreements. The Meerkat Lock-up Agreements will continue to be in full force and effect as of immediately following the Effective Time.

Section 9 Termination

9.1 Termination. This Agreement may be terminated prior to the Effective Time (whether before or after adoption of this Agreement by the Company's stockholders and whether before or after approval of the Meerkat Stockholder Matters by Meerkat's stockholders, unless otherwise specified below):

(a) by mutual written consent of Meerkat and the Company;

(b) by either Meerkat or the Company if the Contemplated Transactions shall not have been consummated by November 15, 2017 (subject to possible extension as provided in this Section 9.1(b), the "***End Date***"); *provided*, *however*, that the right to terminate this Agreement under this Section 9.1(b) shall not be available to the Company, on the one hand, or to Meerkat or Merger Sub, on the other hand, if such Party's action or failure to act has been a principal cause of the failure of the Contemplated Transactions to occur on or before the End Date and such action or failure to act constitutes a breach of this Agreement, provided, further, however, that, in the event that the waiting period under the HSR Act has not expired, or a request for additional information has been made by any Governmental Body, or in the event that the SEC has not declared effective under the Securities Act the Registration Statement by the date which is 60 days prior to the End Date, then either the Company or Meerkat shall be entitled to extend the End Date for an additional 60 days;

(c) by either Meerkat or the Company if a court of competent jurisdiction or other Governmental Body shall have issued a final and nonappealable order, decree or ruling, or shall have taken any other action, having the effect of permanently restraining, enjoining or otherwise prohibiting the Contemplated Transactions;

(d) by Meerkat if the Required Company Stockholder Vote shall not have been obtained within two (2) Business Days of the Registration Statement becoming effective in accordance with the provisions of the Securities Act; *provided*, *however*, that once the Required Company Stockholder Vote has been obtained, Meerkat may not terminate this Agreement pursuant to this Section 9.1(d);

(e) by either Meerkat or the Company if (i) the Meerkat Stockholders' Meeting (including any adjournments and postponements thereof) shall have been held and completed and Meerkat's stockholders shall have taken a final vote on the Meerkat Stockholder Matters and (ii) the Meerkat Stockholder Matters shall not have been approved at the Meerkat Stockholders' Meeting (or at any adjournment or postponement thereof) by the Required Meerkat Stockholder Vote; *provided*, *however*, that the right to terminate this Agreement under this Section 9.1(e) shall not be available to Meerkat where the failure to obtain the Required Meerkat Stockholder Vote shall have been caused by the action or failure to act of Meerkat and such action or failure to act constitutes a material breach by Meerkat of this Agreement;

(f) by the Company (at any time prior to the approval of the Meerkat Stockholder Matters by the Required Meerkat Stockholder Vote) if a Meerkat Triggering Event shall have occurred;

(g) by Meerkat (at any time prior to the adoption of this Agreement and the approval of the Contemplated Transactions by the Required Company Stockholder Vote) if a Company Triggering Event shall have occurred;

(h) by the Company, upon a breach of any representation, warranty, covenant or agreement set forth in this Agreement by Meerkat or Merger Sub, or if any representation or warranty of Meerkat or Merger Sub shall

have become inaccurate, in either case, such that the conditions set forth in Section 8.1 or Section 8.2 would not be satisfied as of the time of such breach or as of the time such representation or warranty shall have become inaccurate; *provided* that the Company is not then in material breach of any representation, warranty, covenant or agreement under this Agreement; *provided*, *further*, that if such inaccuracy in Meerkat's or Merger Sub's representations and warranties or breach by Meerkat or Merger Sub is curable by Meerkat or Merger Sub, then this Agreement shall not terminate pursuant to this Section 9.1(h) as a result of such particular breach or inaccuracy until the earlier of (i) the expiration of a 30-day period commencing upon delivery of written notice from the Company to Meerkat or Merger Sub of such breach or inaccuracy and its intention to terminate pursuant to this Section 9.1(h) and (ii) Meerkat or Merger Sub (as applicable) ceasing to exercise commercially reasonable efforts to cure such breach following delivery of written notice from the Company to Meerkat or Merger Sub of such breach or inaccuracy and its intention to terminate pursuant to this Section 9.1(h) (it being understood that this Agreement shall not terminate pursuant to this Section 9.1(h) as a result of such particular breach or inaccuracy if such breach by Meerkat or Merger Sub is cured prior to such termination becoming effective);

(i) by Meerkat, upon a breach of any representation, warranty, covenant or agreement set forth in this Agreement by the Company, or if any representation or warranty of the Company shall have become inaccurate, in either case, such that the conditions set forth in Section 7.1 or Section 7.2 would not be satisfied as of the time of such breach or as of the time such representation or warranty shall have become inaccurate; *provided* that Meerkat is not then in material breach of any representation, warranty, covenant or agreement under this Agreement; *provided*, *further*, that if such inaccuracy in the Company's representations and warranties or breach by the Company is curable by the Company then this Agreement shall not terminate pursuant to this Section 9.1(i) as a result of such particular breach or inaccuracy until the earlier of (i) the expiration of a 30-day period commencing upon delivery of written notice from Meerkat to the Company of such breach or inaccuracy and its intention to terminate pursuant to this Section 9.1(i) and (ii) the Company ceasing to exercise commercially reasonable efforts to cure such breach following delivery of written notice from Meerkat to the Company of such breach or inaccuracy and its intention to terminate pursuant to this Section 9.1(i) (it being understood that this Agreement shall not terminate pursuant to this Section 9.1(i) as a result of such particular breach or inaccuracy if such breach by the Company is cured prior to such termination becoming effective);

(j) [Reserved];

(k) by Meerkat, at any time prior to the approval of the Meerkat Stockholder Matters by the Required Meerkat Stockholder Vote and following compliance with all of the requirements set forth in the proviso to this Section 9.1(k), upon the Meerkat Board authorizing Meerkat to enter into a Permitted Alternative Agreement; *provided*, *however*, that Meerkat shall not enter into any Permitted Alternative Agreement unless: (i) the Company shall have received written notice from Meerkat of Meerkat's intention to enter into such Permitted Alternative Agreement at least four Business Days in advance, with such notice describing in reasonable detail the reasons for such intention as well as the material terms and conditions of such Permitted Alternative Agreement, including the identity of the counterparty together with copies of the then current draft of such Permitted Alternative Agreement and any other related principal transaction documents, (ii) Meerkat shall have complied in all material respects with its obligations under Section 4.4 and Section 5.3, (iii) the Meerkat Board shall have determined in good faith, after consultation with its outside legal counsel, that the failure to enter into such Permitted Alternative Agreement would be inconsistent with its fiduciary duties under applicable Law and (iv) Meerkat shall concurrently pay to the Company the Company Termination Fee in accordance with Section 9.3(e);

(l) [Reserved]; or

(m) by the Company if, at any time after the date hereof and prior to the Closing, Meerkat's Net Cash has fallen below $33,500,000, such that the Net Cash Condition would not be satisfied as of such time and such deficiency is not reasonably capable of being cured prior to the Closing Date.

The Party desiring to terminate this Agreement pursuant to this Section 9.1 (other than pursuant to Section 9.1(a)) shall give a notice of such termination to the other Party specifying the provisions hereof pursuant to which such termination is made and the basis therefor described in reasonable detail.

9.2 Effect of Termination. In the event of the termination of this Agreement as provided in Section 9.1, this Agreement shall be of no further force or effect; *provided*, *however*, that (a) this Section 9.2, Section 9.3, and Section 10 shall survive the termination of this Agreement and shall remain in full force and effect, and (b) the termination of this Agreement and the provisions of Section 9.3 shall not relieve any Party of any liability for fraud or for any willful and material breach of any representation, warranty, covenant, obligation or other provision contained in this Agreement.

9.3 Expenses; Termination Fees.

(a) Except as set forth in this Section 9.3 and Section 5.11 all fees and expenses incurred in connection with this Agreement and the Contemplated Transactions shall be paid by the Party incurring such expenses, whether or not the Merger is consummated; *provided*, *however*, that Meerkat and the Company shall share equally all fees and expenses, other than attorneys' and accountants' fees and expenses, incurred in relation to the filings by the Parties under any filing requirement under the HSR Act and any foreign antitrust Law applicable to this Agreement and the transactions contemplated hereby; *provided*, *further however*, that Meerkat and the Company shall also share equally all fees and expenses incurred in relation to the printing and filing with the SEC of the Registration Statement (including any financial statements and exhibits) and any amendments or supplements thereto and paid to a financial printer or the SEC.

(b) If (i) (A) this Agreement is terminated by Meerkat or the Company pursuant to Section 9.1(e), or (B) this Agreement is terminated by the Company pursuant to Section 9.1(b) or Section 9.1(h), (ii) at any time after the date of this Agreement and prior to the Meerkat Stockholders' Meeting an Acquisition Proposal with respect to Meerkat shall have been publicly announced, disclosed or otherwise communicated to the Meerkat Board (and shall not have been withdrawn) and (iii) within 12 months after the date of such termination, Meerkat enters into a definitive agreement with respect to a Subsequent Transaction or consummates a Subsequent Transaction, then Meerkat shall pay to the Company, upon such entry into a definitive agreement and/or consummation of a Subsequent Transaction, a nonrefundable fee in an amount equal to $2,000,000 (the "***Company Termination Fee***"), less any amount previously paid to the Company pursuant to Section 9.3(f), plus any amount payable to the Company pursuant to Section 9.3(h).

(c) If (i) this Agreement is terminated by Meerkat pursuant to Section 9.1(d), (ii) at any time after the date of this Agreement and before obtaining the Required Company Stockholder Vote an Acquisition Proposal with respect to the Company shall have been publicly announced, disclosed or otherwise communicated to the Company Board (and shall not have been withdrawn), and (iii) within 12 months after the date of such termination, the Company enters into a definitive agreement with respect to a Subsequent Transaction or consummates a Subsequent Transaction, then the Company shall pay to Meerkat, upon such entry into a definitive agreement and/or consummation of a Subsequent Transaction, a nonrefundable fee in an amount equal to $2,000,000 (the "***Meerkat Termination Fee***"), less any amount previously paid to Meerkat pursuant to Section 9.3(g), plus any amount payable to Meerkat pursuant to Section 9.3(h).

(d) If this Agreement is terminated by Meerkat pursuant to Section 9.1(g), then the Company shall pay to Meerkat, concurrent with such termination, the Meerkat Termination Fee, in addition to any amount payable to Meerkat pursuant to Section 9.3(h)

(e) If (i) this Agreement is terminated by Meerkat pursuant to Section 9.1(k) or (ii) this Agreement is terminated by the Company pursuant to Section 9.1(f), then Meerkat shall pay to the Company, concurrent with such termination, the Company Termination Fee, in addition to any amount payable to the Company pursuant to Section 9.3(h).

(f) (i) If this Agreement is terminated by the Company pursuant to Section 9.1(e), 9.1(h) or 9.1(m) or (ii) in the event of the failure of the Company to consummate the transactions to be contemplated at the Closing solely as a result of a Meerkat Material Adverse Effect as set forth in Section 8.5 (*provided*, that at such time all of the other conditions precedent to Meerkat's obligation to close set forth in Section 6 and Section 7 have been satisfied by the Company, are capable of being satisfied by the Company or have been waived by Meerkat), then Meerkat shall reimburse the Company for all reasonable out-of-pocket fees and expenses incurred by the Company in connection with this Agreement and the Contemplated Transactions (such expenses, collectively, the "***Third Party Expenses***"), up to a maximum of $1,000,000, by wire transfer of same-day funds within ten Business Days following the date on which the Company submits to Meerkat true and correct copies of reasonable documentation supporting such Third Party Expenses; *provided*, *however*, that such Third Party Expenses shall not include any amounts for financial advisors to the Company except for reasonably documented out-of-pocket expenses otherwise reimbursable by the Company to such financial advisors pursuant to the terms of the Company's engagement letter or similar arrangement with such financial advisors.

(g) (i) If this Agreement is terminated by Meerkat pursuant to Section 9.1(d) or 9.1(i) or (ii) in the event of the failure of Meerkat to consummate the transactions to be consummated at the Closing solely as a result of a Company Material Adverse Effect as set forth in Section 7.6, (*provided*, that at such time all of the other conditions precedent to the Company's obligation to close set forth in Section 6 and Section 8 have been satisfied by Meerkat, are capable of being satisfied by Meerkat or have been waived by the Company), the Company shall reimburse Meerkat for all Third Party Expenses incurred by Meerkat up to a maximum of $1,000,000, by wire transfer of same-day funds within ten Business Days following the date on which Meerkat submits to the Company true and correct copies of reasonable documentation supporting such Third Party Expenses; *provided*, *however*, that such Third Party Expenses shall not include any amounts for financial advisors to Meerkat except for reasonably documented out-of-pocket expenses otherwise reimbursable by Meerkat to such financial advisors pursuant to the terms of Meerkat's engagement letter or similar arrangement with such financial advisors.

(h) If either Party fails to pay when due any amount payable by it under this Section 9.3, then (i) such Party shall reimburse the other Party for reasonable costs and expenses (including reasonable fees and disbursements of counsel) incurred in connection with the collection of such overdue amount and the enforcement by the other Party of its rights under this Section 9.3, and (ii) such Party shall pay to the other Party interest on such overdue amount (for the period commencing as of the date such overdue amount was originally required to be paid and ending on the date such overdue amount is actually paid to the other Party in full) at a rate per annum equal to the "prime rate" (as announced by Bank of America or any successor thereto) in effect on the date such overdue amount was originally required to be paid plus three percent.

(i) The Parties agree that, subject to Section 9.2, the payment of the fees and expenses set forth in this Section 9.3 shall be the sole and exclusive remedy of each Party following a termination of this Agreement under the circumstances described in this Section 9.3, it being understood that in no event shall either Meerkat or the Company be required to pay the individual fees or damages payable pursuant to this Section 9.3 on more than one occasion. Subject to Section 9.2, following the payment of the fees and expenses set forth in this Section 9.3 by a Party, (i) such party shall have no further liability to the other Party in connection with or arising out of this Agreement or the termination thereof, any breach of this Agreement by the other Party giving rise to such termination, or the failure of the Contemplated Transactions to be consummated, (ii) no other Party or their respective Affiliates shall be entitled to bring or maintain any other claim, action or proceeding against such Party or seek to obtain any recovery, judgment or damages of any kind against such Party (or any partner, member, stockholder, director, officer, employee, Subsidiary, affiliate, agent or other representative of such Party) in connection with or arising out of this Agreement or the termination thereof, any breach by such Party giving rise to such termination or the failure of the Contemplated Transactions to be consummated and (iii) all other Parties and their respective Affiliates shall be precluded from any other remedy against such Party and its Affiliates, at law or in equity or otherwise, in connection with or arising out of this Agreement or the termination thereof, any breach by such Party giving rise to such termination or the failure of the Contemplated Transactions to be consummated. Each of the Parties acknowledges that (x) the agreements contained in this Section 9.3 are an

integral part of the Contemplated Transactions, (y) without these agreements, the Parties would not enter into this Agreement and (z) any amount payable pursuant to this Section 9.3 is not a penalty, but rather is liquidated damages in a reasonable amount that will compensate the Parties in the circumstances in which such amount is payable.

Section 10 Miscellaneous Provisions

10.1 Non-Survival of Representations and Warranties. The representations and warranties of the Company, Meerkat and Merger Sub contained in this Agreement or any certificate or instrument delivered pursuant to this Agreement shall terminate at the Effective Time, and only the covenants that by their terms survive the Effective Time and this Section 10 shall survive the Effective Time.

10.2 Amendment. This Agreement may be amended with the approval of the respective Boards of Directors of the Company, Merger Sub and Meerkat at any time (whether before or after the adoption and approval of this Agreement by the Company's stockholders or before or after obtaining the Required Meerkat Stockholder Vote); *provided*, *however*, that after any such approval of this Agreement by a Party's stockholders, no amendment shall be made which by law requires further approval of such stockholders without the further approval of such stockholders. This Agreement may not be amended except by an instrument in writing signed on behalf of each of the Company, Merger Sub and Meerkat.

10.3 Waiver.

(a) No failure on the part of any Party to exercise any power, right, privilege or remedy under this Agreement, and no delay on the part of any Party in exercising any power, right, privilege or remedy under this Agreement, shall operate as a waiver of such power, right, privilege or remedy; and no single or partial exercise of any such power, right, privilege or remedy shall preclude any other or further exercise thereof or of any other power, right, privilege or remedy.

(b) No Party shall be deemed to have waived any claim arising out of this Agreement, or any power, right, privilege or remedy under this Agreement, unless the waiver of such claim, power, right, privilege or remedy is expressly set forth in a written instrument duly executed and delivered on behalf of such Party and any such waiver shall not be applicable or have any effect except in the specific instance in which it is given.

10.4 Entire Agreement; Counterparts; Exchanges by Facsimile. This Agreement and the other agreements referred to in this Agreement constitute the entire agreement and supersede all prior agreements and understandings, both written and oral, among or between any of the Parties with respect to the subject matter hereof and thereof; *provided*, *however*, that the Confidentiality Agreement shall not be superseded and shall remain in full force and effect in accordance with its terms. This Agreement may be executed in several counterparts, each of which shall be deemed an original and all of which shall constitute one and the same instrument. The exchange of a fully executed Agreement (in counterparts or otherwise) by all Parties by facsimile or electronic transmission in .PDF format shall be sufficient to bind the Parties to the terms and conditions of this Agreement.

10.5 Applicable Law; Jurisdiction. This Agreement shall be governed by, and construed in accordance with, the laws of the State of Delaware, regardless of the laws that might otherwise govern under applicable principles of conflicts of laws. In any action or proceeding between any of the Parties arising out of or relating to this Agreement or any of the Contemplated Transactions, each of the Parties: (a) irrevocably and unconditionally consents and submits to the exclusive jurisdiction and venue of the Court of Chancery of the State of Delaware or, to the extent such court does not have subject matter jurisdiction, the Superior Court of the State of Delaware or the United States District Court for the District of Delaware; (b) agrees that all claims in respect of such action or proceeding shall be heard and determined exclusively in accordance with clause (a) of this Section 10.5; (c) waives any objection to laying venue in any such action or proceeding in such courts; (d) waives any

objection that such courts are an inconvenient forum or do not have jurisdiction over any Party; (e) agrees that service of process upon such Party in any such action or proceeding shall be effective if notice is given in accordance with Section 10.8 of this Agreement; and (f) irrevocably waives the right to trial by jury.

10.6 Attorneys' Fees. In any action at law or suit in equity to enforce this Agreement or the rights of any of the Parties, the prevailing Party in such action or suit (as determined by a court of competent jurisdiction) shall be entitled to recover its reasonable out-of-pocket attorneys' fees and all other reasonable costs and expenses incurred in such action or suit.

10.7 Assignability. This Agreement shall be binding upon, and shall be enforceable by and inure solely to the benefit of, the Parties and their respective successors and assigns; *provided*, *however*, that neither this Agreement nor any of a Party's rights or obligations hereunder may be assigned or delegated by such Party without the prior written consent of the other Party, and any attempted assignment or delegation of this Agreement or any of such rights or obligations by such Party without the other Party's prior written consent shall be void and of no effect.

10.8 Notices. All notices and other communications hereunder shall be in writing and shall be deemed to have been duly delivered and received hereunder (a) one Business Day after being sent for next Business Day delivery, fees prepaid, via a reputable international overnight courier service, (b) upon delivery in the case of delivery by hand, or (c) on the date delivered in the place of delivery if sent by email or facsimile (with a written or electronic confirmation of delivery) prior to 6:00 p.m. New York City time, otherwise on the next succeeding Business Day, in each case to the intended recipient as set forth below:

if to Meerkat or Merger Sub:

Mirna Therapeutics, Inc.
PO Box 163387
Austin, TX 78716
Attention: Paul Lammers
Email: plammers@mirnarx.com

with a copy to (which shall not constitute notice):

Latham & Watkins LLP
140 Scott Drive
Menlo Park, California 94025
Fax: (650) 463-2600
Attention: Mark Roeder; Chad Rolston
Email: mark.roeder@lw.com; chad.rolston@lw.com

if to the Company:

Synlogic, Inc.
200 Sidney St., Suite 320
Cambridge, Massachusetts 02139
Fax: 617-395-6882
Attention: Jose-Carlos Gutiérrez-Ramos
Email: jc@synlogictx.com

with a copy to (which shall not constitute notice):

Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.
One Financial Center
Boston, Massachusetts 02111
Fax: (617) 542-2241
Attention: Matthew J. Gardella, Esq.; Lewis J. Geffen, Esq.
Email: mgardella@mintz.com; ljgeffen@mintz.com

10.9 Cooperation. Each Party agrees to cooperate fully with the other Party and to execute and deliver such further documents, certificates, agreements and instruments and to take such other actions as may be reasonably requested by the other Party to evidence or reflect the Contemplated Transactions and to carry out the intent and purposes of this Agreement.

10.10 Severability. Any term or provision of this Agreement that is invalid or unenforceable in any situation in any jurisdiction shall not affect the validity or enforceability of the remaining terms and provisions of this Agreement or the validity or enforceability of the offending term or provision in any other situation or in any other jurisdiction. If a final judgment of a court of competent jurisdiction declares that any term or provision of this Agreement is invalid or unenforceable, the Parties agree that the court making such determination shall have the power to limit such term or provision, to delete specific words or phrases or to replace such term or provision with a term or provision that is valid and enforceable and that comes closest to expressing the intention of the invalid or unenforceable term or provision, and this Agreement shall be valid and enforceable as so modified. In the event such court does not exercise the power granted to it in the prior sentence, the Parties agree to replace such invalid or unenforceable term or provision with a valid and enforceable term or provision that will achieve, to the extent possible, the economic, business and other purposes of such invalid or unenforceable term or provision.

10.11 Other Remedies; Specific Performance. Except as otherwise provided herein, any and all remedies herein expressly conferred upon a Party will be deemed cumulative with and not exclusive of any other remedy conferred hereby, or by law or equity upon such Party, and the exercise by a Party of any one remedy will not preclude the exercise of any other remedy. The Parties agree that irreparable damage would occur in the event that any of the provisions of this Agreement were not performed in accordance with their specific terms or were otherwise breached. It is accordingly agreed that the Parties shall be entitled to an injunction or injunctions to prevent breaches of this Agreement and to enforce specifically the terms and provisions hereof in any court of the United States or any state having jurisdiction, this being in addition to any other remedy to which they are entitled at law or in equity, and each of the Parties waives any bond, surety or other security that might be required of any other Party with respect thereto.

10.12 No Third Party Beneficiaries. Nothing in this Agreement, express or implied, is intended to or shall confer upon any Person (other than the Parties and the D&O Indemnified Parties to the extent of their respective rights pursuant to Section 5.8) any right, benefit or remedy of any nature whatsoever under or by reason of this Agreement.

10.13 Construction.

(a) For purposes of this Agreement, whenever the context requires: the singular number shall include the plural, and vice versa; the masculine gender shall include the feminine and neuter genders; the feminine gender shall include the masculine and neuter genders; and the neuter gender shall include masculine and feminine genders.

(b) The Parties agree that any rule of construction to the effect that ambiguities are to be resolved against the drafting Party shall not be applied in the construction or interpretation of this Agreement.

(c) As used in this Agreement, the words “include” and “including,” and variations thereof, shall not be deemed to be terms of limitation, but rather shall be deemed to be followed by the words “without limitation.”

(d) The use of the word “or” shall not be exclusive.

(e) Except as otherwise indicated, all references in this Agreement to “Sections,” “Exhibits” and “Schedules” are intended to refer to Sections of this Agreement and Exhibits and Schedules to this Agreement, respectively.

(f) Any reference to legislation or to any provision of any legislation shall include any modification, amendment, re-enactment thereof, any legislative provision substituted therefore and all rules, regulations, and statutory instruments issued or related to such legislations.

(g) The bold-faced headings contained in this Agreement are for convenience of reference only, shall not be deemed to be a part of this Agreement and shall not be referred to in connection with the construction or interpretation of this Agreement.

(h) The Parties agree that the Company Disclosure Schedule or Meerkat Disclosure Schedule shall be arranged in sections and subsections corresponding to the numbered and lettered sections and subsections contained in Section 2 or Section 3, respectively. The disclosures in any section or subsection of the Company Disclosure Schedule or the Meerkat Disclosure Schedule shall qualify other sections and subsections in Section 2 or Section 3, respectively, to the extent it is readily apparent from a reading of the disclosure that such disclosure is applicable to such other sections and subsections. The disclosures in any section or subsection of the Meerkat Disclosure Schedule shall qualify other sections and subsections in Section 3, to the extent it is readily apparent from a reading of the disclosure that such disclosure is applicable to such other sections and subsections.

(i) “delivered” or “made available” shall mean, with respect to any documentation, that prior to 11:59 p.m. (New York City time) on the date that is two calendar days prior to the date of this Agreement, a copy of such material has been posted to and made available by a Party to the other Party and its Representatives in the electronic data room maintained by such disclosing Party.

(*Remainder of page intentionally left blank*)

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed as of the date first above written.

MIRNA THERAPEUTICS, INC.

By: /s/ Paul Lammers
Name: Paul Lammers
Title: President and Chief Executive Officer

MEERKAT MERGER SUB, INC.

By: /s/ Paul Lammers
Name: Paul Lammers
Title: President and Chief Executive Officer

SYNLOGIC, INC.

By: /s/ Jose Carlos Gutiérrez-Ramos
Name: Jose Carlos Gutiérrez-Ramos
Title: President and Chief Executive Officer

[SIGNATURE PAGE TO AGREEMENT AND PLAN OF MERGER AND REORGANIZATION]

EXHIBIT A

CERTAIN DEFINITIONS

a) For purposes of the Agreement (including this Exhibit A):

"***Acquisition Inquiry***" shall mean, with respect to a Party, an inquiry, indication of interest or request for information (other than an inquiry, indication of interest or request for information made or submitted by the Company, on the one hand, or Meerkat, on the other hand, to the other Party) that could reasonably be expected to lead to an Acquisition Proposal.

"***Acquisition Proposal***" shall mean, with respect to a Party, any offer or proposal, whether written or oral (other than an offer or proposal made or submitted by or on behalf of the Company or any of its Affiliates, on the one hand, or by or on behalf of Meerkat or any of its Affiliates, on the other hand, to the other Party) contemplating or otherwise relating to any Acquisition Transaction with such Party.

"***Acquisition Transaction***" shall mean any transaction or series of related transactions involving:

(a) any merger, consolidation, amalgamation, share exchange, business combination, issuance of securities, acquisition of securities, reorganization, recapitalization, tender offer, exchange offer or other similar transaction: (i) in which a Party is a constituent entity; (ii) in which a Person or "group" (as defined in the Exchange Act and the rules promulgated thereunder) of Persons directly or indirectly acquires beneficial or record ownership of securities representing more than 20% of the outstanding securities of any class of voting securities of a Party or any of its Subsidiaries; or (iii) in which a Party or any of its Subsidiaries issues securities representing more than 20% of the outstanding securities of any class of voting securities of such Party or any of its Subsidiaries; or

(b) any sale, lease, exchange, transfer, license, acquisition or disposition of any business or businesses or assets that constitute or account for 20% or more of the consolidated book value or the fair market value of the assets of a Party and its Subsidiaries, taken as a whole.

"***Affiliate***" shall have the meaning given to such term in Rule 145 under the Securities Act.

"***Agreement***" shall mean the Agreement and Plan of Merger and Reorganization to which this Exhibit A is attached, as it may be amended from time to time.

"***Allocation Certificate***" shall have the meaning set forth in Section 5.20.

"***Business Day***" shall mean any day other than a day on which banks in the State of New York are authorized or obligated to be closed.

"***COBRA***" means the Consolidated Omnibus Budget Reconciliation Act of 1985, as set forth in Section 4980B of the Code and Part 6 of Title I of ERISA.

"***Code***" shall mean the Internal Revenue Code of 1986, as amended.

"***Company Affiliate***" shall mean any Person that is (or at any relevant time was) under common control with the Company within the meaning of Sections 414(b), (c), (m) and (o) of the Code, and the regulations issued thereunder.

"***Company Associate***" shall mean any current or former employee, independent contractor, officer or director of the Company or any of its Subsidiaries.

"***Company Board***" shall mean the board of directors of the Company.

"***Company Capital Stock***" shall mean the Company Common Stock and the Company Preferred Stock.

"***Company Capitalization Representations***" shall mean the representations and warranties of the Company set forth in Sections 2.6(a) and (d).

"***Company Common Stock***" shall mean the Common Stock, $0.0001 par value per share, of the Company.

"***Company Contract***" shall mean any Contract: (a) to which the Company or any of its Subsidiaries is a Party; (b) by which the Company or any of its Subsidiaries or any Company IP Rights or any other asset of the Company or its Subsidiaries is or may become bound or under which the Company or any of its Subsidiaries has, or may become subject to, any obligation; or (c) under which the Company or any of its Subsidiaries has or may acquire any right or interest.

"***Company Fundamental Representations***" shall mean the representations and warranties of the Company set forth in Sections 2.1(a), 2.1(b), 2.2, 2.3, 2.4 and 2.21.

"***Company IP Rights***" shall mean all Intellectual Property owned, licensed, or controlled by the Company or its Subsidiaries that is necessary for or used in the operation of the business of the Company and its Subsidiaries as presently conducted.

"***Company IP Rights Agreement***" shall mean any instrument or agreement governing, related to or pertaining to any Company IP Rights.

"***Company Material Adverse Effect***" shall mean any Effect that, considered together with all other Effects that have occurred prior to the date of determination of the occurrence of a Company Material Adverse Effect, has or would reasonably be expected to have a material adverse effect on the business, financial condition, assets, liabilities or results of operations of the Company or its Subsidiaries, taken as a whole; *provided*, *however*, that Effects arising or resulting from the following shall not be taken into account in determining whether there has been a Company Material Adverse Effect: (a) any rejection or non-acceptance by a Governmental Body of a registration or filing by the Company relating to the Company IP Rights; (b) the announcement of the Agreement or the pendency of the Contemplated Transactions; (c) the taking of any action, or the failure to take any action, by the Company that is required to comply with the terms of the Agreement; (d) any natural disaster or any act or threat of terrorism or war anywhere in the world, any armed hostilities or terrorist activities anywhere in the world, any threat or escalation or armed hostilities or terrorist activities anywhere in the world or any governmental or other response or reaction to any of the foregoing; (e) any change in GAAP or applicable Law or the interpretation thereof; (f) general economic or political conditions or conditions generally affecting the industries in which the Company and its Subsidiaries operate; or (g) any change in the cash position of the Company and its Subsidiaries which results from operations in the Ordinary Course of Business; except in each case with respect to clauses (d), (e) and (f), to the extent disproportionately affecting the Company and its Subsidiaries, taken as a whole, relative to other similarly situated companies in the industries in which the Company and its Subsidiaries operate.

"***Company Options***" shall mean options or other rights to purchase shares of Company Capital Stock issued by the Company.

"***Company Registered IP***" shall mean all Company IP Rights that are owned by the Company that are registered, filed or issued under the authority of, with or by any Governmental Body, including all patents, registered copyrights and registered trademarks and all applications for any of the foregoing.

"***Company Stockholder Support Agreements***" shall have the meaning set forth in the recitals.

"***Company Stockholder Written Consent***" shall have the meaning set forth in the recitals.

"***Company Triggering Event***" shall be deemed to have occurred if: (a) the Company Board or any committee thereof shall have made a Company Board Adverse Recommendation Change or approved, endorsed or recommended any Acquisition Proposal; (b) the Company shall have entered into any letter of intent or similar document or any Contract relating to any Acquisition Proposal (other than a confidentiality agreement permitted pursuant to Section 4.4); or (c) the Company or any director or officer of the Company shall have willfully and intentionally breached the provisions set forth in Section 4.4 or Section 5.2 of the Agreement.

"***Company Unaudited Interim Balance Sheet***" shall mean the unaudited consolidated balance sheet of the Company and its consolidated Subsidiaries as of March 31, 2017 provided to Meerkat prior to the date of the Agreement.

"***Confidentiality Agreement***" shall mean the Confidentiality Agreement dated December 7, 2016, between the Company and Meerkat.

"***Consent***" shall mean any approval, consent, ratification, permission, waiver or authorization (including any Governmental Authorization).

"***Contemplated Transactions***" shall mean the Merger and the other transactions contemplated by the Agreement.

"***Contract***" shall mean, with respect to any Person, any written agreement, contract, subcontract, lease (whether for real or personal property), mortgage, license, or other legally binding commitment or undertaking of any nature to which such Person is a party or by which such Person or any of its assets are bound or affected under applicable Law.

"***CPRIT***" shall mean the Cancer Prevention & Research Institute of Texas.

"***CPRIT Resolution***" shall mean the arrangements with respect to Meerkat's existing grants with CPRIT as set forth on Schedule A.

"***DGCL***" shall mean the General Corporation Law of the State of Delaware.

"***Effect***" shall mean any effect, change, event, circumstance, or development.

"***Encumbrance***" shall mean any lien, pledge, hypothecation, charge, mortgage, security interest, lease, license, option, easement, reservation, servitude, adverse title, claim, infringement, interference, option, right of first refusal, preemptive right, community property interest or restriction or encumbrance of any nature (including any restriction on the voting of any security, any restriction on the transfer of any security or other asset, any restriction on the receipt of any income derived from any asset, any restriction on the use of any asset and any restriction on the possession, exercise or transfer of any other attribute of ownership of any asset).

"Enforceability Exceptions" means the (a) laws of general application relating to bankruptcy, insolvency and the relief of debtors; and (b) rules of law governing specific performance, injunctive relief and other equitable remedies.

"***Entity***" shall mean any corporation (including any non-profit corporation), partnership (including any general partnership, limited partnership or limited liability partnership), joint venture, estate, trust, company (including any company limited by shares, limited liability company or joint stock company), firm, society or other enterprise, association, organization or entity, and each of its successors.

"***Environmental Law***" means any federal, state, local or foreign Law relating to pollution or protection of human health or the environment (including ambient air, surface water, ground water, land surface or subsurface

strata), including any law or regulation relating to emissions, discharges, releases or threatened releases of Hazardous Materials, or otherwise relating to the manufacture, processing, distribution, use, treatment, storage, disposal, transport or handling of Hazardous Materials.

"***ERISA***" shall mean the Employee Retirement Income Security Act of 1974.

"***ERISA Affiliate***" means any entity (whether or not incorporated) treated as a single employer with the Company or Meerkat, as applicable, for purposes of Section 414 of the Code.

"***Exchange Act***" shall mean the Securities Exchange Act of 1934.

"***Exchange Ratio***" means, subject to Section 1.5(f), the following ratio (rounded to four decimal places): the quotient obtained by dividing (a) the Company Merger Shares by (b) the Company Outstanding Shares, in which:

- "***Company Allocation Percentage***" means 1.00 minus the Meerkat Allocation Percentage.
- "***Company Merger Shares***" means the product determined by multiplying (i) the Post-Closing Meerkat Shares by (ii) the Company Allocation Percentage.
- "***Company Outstanding Shares***" means the total number of shares of Company Capital Stock outstanding immediately prior to the Effective Time expressed on a fully-diluted and as-converted to Company Common Stock basis and assuming, without limitation or duplication, (i) the exercise of all Company Options outstanding as of immediately prior to the Effective Time, and (ii) the issuance of shares of Company Common Stock in respect of all other options, warrants or rights to receive such shares that will be outstanding immediately after the Effective Time.
- "***Post-Closing Meerkat Shares***" mean the quotient determined by dividing (i) the Meerkat Outstanding Shares by (ii) the Meerkat Allocation Percentage.
- "***Meerkat Allocation Percentage***" means 0.1685; provided, however, to the extent that the Net Cash determined pursuant to Section 1.6: (i) is less than forty million dollars ($40,000,000), then 0.1685 shall be reduced by 0.0003 for each one hundred thousand dollars ($100,000) that the Net Cash as so determined is less than forty million dollars ($40,000,000) (for example, the Meerkat Allocation Percentage would be 0.1623 if the Net Cash determined pursuant to Section 1.6 is thirty-eight million dollars ($38,000,000)) and (ii) is more than forty million dollars ($40,000,000), then 0.1685 shall be increased by 0.0003 for each one hundred thousand dollars ($100,000) that the Net Cash as so determined is more than forty million dollars ($40,000,000) (for example, the Meerkat Allocation Percentage would be 0.1747 if the Net Cash determined pursuant to Section 1.6 is forty-two million dollars ($42,000,000)).
- "***Meerkat Outstanding Shares***" means, subject to Section 1.5(f), the total number of shares of Meerkat Common Stock outstanding immediately prior to the Effective Time expressed on a fully-diluted and as-converted to Meerkat Common Stock basis, and assuming, without limitation or duplication, (i) the settlement in shares of each Meerkat Option outstanding as of the Effective Time pursuant to Section 5.6, solely to the extent such Meerkat Option will not be canceled at the Effective Time pursuant to Section 5.6 or exercised prior thereto and (ii) the issuance of shares of Meerkat Common Stock in respect of all other options, warrants or rights to receive such shares that will be outstanding immediately after the Effective Time.

"***Governmental Authorization***" shall mean any: (a) permit, license, certificate, franchise, permission, variance, exception, order, clearance, registration, qualification or authorization issued, granted, given or otherwise made available by or under the authority of any Governmental Body or pursuant to any Law; or (b) right under any Contract with any Governmental Body.

"***Governmental Body***" shall mean any: (a) nation, state, commonwealth, province, territory, county, municipality, district or other jurisdiction of any nature; (b) federal, state, local, municipal, foreign or other

government; (c) governmental or quasi-governmental authority of any nature (including any governmental division, department, agency, commission, bureau, instrumentality, official, ministry, fund, foundation, center, organization, unit, body or Entity and any court or other tribunal, and for the avoidance of doubt, any Taxing authority); or (d) self-regulatory organization (including the NASDAQ Stock Market).

"***Hazardous Materials***" shall mean any pollutant, chemical, substance and any toxic, infectious, carcinogenic, reactive, corrosive, ignitable or flammable chemical, or chemical compound, or hazardous substance, material or waste, whether solid, liquid or gas, that is subject to regulation, control or remediation under any Environmental Law, including without limitation, crude oil or any fraction thereof, and petroleum products or by-products.

"***HSR Act***" shall mean the Hart-Scott-Rodino Antitrust Improvements Act of 1976.

"***Intellectual Property***" shall mean (a) United States, foreign and international patents, patent applications, including provisional applications, statutory invention registrations, invention disclosures and inventions, (b) trademarks, service marks, trade names, domain names, URLs, trade dress, logos and other source identifiers, including registrations and applications for registration thereof, (c) copyrights, including registrations and applications for registration thereof, and (d) software, formulae, customer lists, trade secrets, know-how, confidential information and other proprietary rights and intellectual property, whether patentable or not.

"***IRS***" shall mean the United States Internal Revenue Service.

"***Key Employee***" shall mean, with respect to the Company or Meerkat, an executive officer of such Party or any employee of such Party that reports directly to the board of directors of such Party or to the Chief Executive Officer or Chief Operating Officer of such Party.

"***Knowledge***" means, with respect to an individual, that such individual is actually aware of the relevant fact or such individual would reasonably be expected to know such fact in the ordinary course of the performance of such individual's employment responsibilities. Any Person that is an Entity shall have Knowledge if any executive officer or director of such Person as of the date such knowledge is imputed has Knowledge of such fact or other matter.

"***Law***" shall mean any federal, state, national, foreign, material local or municipal or other law, statute, constitution, principle of common law, resolution, ordinance, code, edict, decree, rule, regulation, ruling or requirement issued, enacted, adopted, promulgated, implemented or otherwise put into effect by or under the authority of any Governmental Body (including under the authority of the NASDAQ Stock Market or the Financial Industry Regulatory Authority).

"***Legal Proceeding***" shall mean any action, suit, litigation, arbitration, proceeding (including any civil, criminal, administrative, investigative or appellate proceeding), hearing, inquiry, audit, examination or investigation commenced, brought, conducted or heard by or before, or otherwise involving, any court or other Governmental Body or any arbitrator or arbitration panel.

"***Meerkat Affiliate***" shall mean any Person that is (or at any relevant time was) under common control with Meerkat within the meaning of Sections 414(b), (c), (m) and (o) of the Code, and the regulations issued thereunder.

"***Meerkat Associate***" shall mean any current or former employee, independent contractor, officer or director of Meerkat or any of its Subsidiaries.

"***Meerkat Board***" shall mean the board of directors of Meerkat.

"***Meerkat Capitalization Representations***" shall mean the representations and warranties of Meerkat and Merger Sub set forth in Sections 3.6(a) and 3.6(d).

"***Meerkat Closing Price***" means the volume weighted average closing trading price of a share of Meerkat Common Stock on the NASDAQ Global Market (or such other NASDAQ market on which the Meerkat Common Stock then trades) for the five trading days ending the trading day immediately prior to the date upon which the Merger becomes effective.

"***Meerkat Common Stock***" shall mean the Common Stock, $0.001 par value per share, of Meerkat.

"***Meerkat Contract***" shall mean any Contract: (a) to which Meerkat is a party; (b) by which Meerkat or any Meerkat IP Rights or any other asset of Meerkat is or may become bound or under which Meerkat has, or may become subject to, any obligation; or (c) under which Meerkat has or may acquire any right or interest.

"***Meerkat Fundamental Representations***" shall mean the representations and warranties of Meerkat and Merger Sub set forth in Sections 3.1(a), 3.1(b), 3.3, 3.4, 3.21 and 3.24.

"***Meerkat IP Rights***" shall mean all Intellectual Property owned, licensed or controlled by Meerkat that is necessary for the operation of the business of Meerkat as presently conducted.

"***Meerkat IP Rights Agreement***" shall mean any instrument or agreement governing, related or pertaining to any Meerkat IP Rights.

"***Meerkat Material Adverse Effect***" shall mean any Effect that, considered together with all other Effects that have occurred prior to the date of determination of the occurrence of the Meerkat Material Adverse Effect, has or would reasonably be expected to have a material adverse effect on the business, financial condition, assets, liabilities or results of operations of Meerkat; *provided*, *however*, that Effects arising or resulting from the following shall not be taken into account in determining whether there has been a Meerkat Material Adverse Effect: (a) any rejection or non-acceptance by a Governmental Body of a registration statement or filing by Meerkat relating to the Meerkat IP Rights; (b) the announcement of the Agreement or the pendency of the Contemplated Transactions; (c) any change in the stock price or trading volume of Meerkat Common Stock (it being understood, however, that any Effect causing or contributing to any change in stock price or trading volume of Meerkat Common Stock may be taken into account in determining whether a Meerkat Material Adverse Effect has occurred, unless such Effects are otherwise excepted from this definition); (d) the taking of any action, or the failure to take any action, by Meerkat that is required to comply with the terms of the Agreement or the taking of any action expressly permitted by Section 4.1(b) of the Meerkat Disclosure Schedule; (e) any natural disaster or any act or threat of terrorism or war anywhere in the world, any armed hostilities or terrorist activities anywhere in the world, any threat or escalation or armed hostilities or terrorist activities anywhere in the world or any governmental or other response or reaction to any of the foregoing; (f) any change in GAAP or applicable Law or the interpretation thereof; or (g) general economic or political conditions or conditions generally affecting the industries in which Meerkat operates; except, in each case with respect to clauses (e), (f) and (g), to the extent disproportionately affecting Meerkat relative to other similarly situated companies in the industries in which Meerkat operates.

"***Meerkat Options***" shall mean options or other rights to purchase shares of Meerkat Common Stock issued by Meerkat.

"***Meerkat Registered IP***" shall mean all Meerkat IP Rights that are registered, filed or issued under the authority of, with or by any Governmental Body, including all patents, registered copyrights and registered trademarks and all applications for any of the foregoing.

"***Meerkat Reverse Stock Split***" shall have the meaning set forth in Section 5.22.

"***Meerkat Stockholder Support Agreements***" shall have the meaning set forth in the recitals.

"*Meerkat Transaction Expenses*" shall mean the sum of (a) the cash cost of any change of control payments or severance payments that are or become due to any employee of Meerkat in connection with the consummation of the Contemplated Transactions and that are unpaid as of the Closing, (b) the cash cost of any retention payments that are or become due to any employee of Meerkat in connection with the consummation of the Contemplated Transactions and that are unpaid as of the Closing, and (c) any costs, fees and expenses incurred by Meerkat, or for which Meerkat is liable, in connection with the negotiation, preparation and execution of the Agreement and the consummation of the Contemplated Transactions (including in connection with any stockholder litigation relating to this Agreement or any of the Contemplated Transactions) and that are unpaid as of the Closing, including brokerage fees and commissions, finders' fees or financial advisory fees, or any fees and expenses of counsel or accountants payable by Meerkat.

"***Meerkat Triggering Event***" shall be deemed to have occurred if: (a) Meerkat shall have failed to include in the Proxy Statement the Meerkat Board Recommendation or shall have made a Meerkat Board Adverse Recommendation Change; (b) the Meerkat Board or any committee thereof shall have approved, endorsed or recommended any Acquisition Proposal; (c) Meerkat shall have entered into any letter of intent or similar document or any Contract relating to any Acquisition Proposal (other than a confidentiality agreement permitted pursuant to Section 4.4); (d) Meerkat or any director or officer of Meerkat shall have willfully and intentionally breached the provisions set forth in Section 4.4 or Section 5.3 of the Agreement; or (e) Meerkat shall have failed to hold the Meerkat Stockholders' Meeting within 60 days after the Registration Statement is declared effective under the Securities Act.

"***Meerkat Unaudited Interim Balance Sheet***" shall mean the unaudited balance sheet of Meerkat as of September 30, 2016, included in Meerkat's Report on Form 10-Q for the fiscal quarter ended September 30, 2016, as filed with the SEC.

"***Merger Sub Board***" shall mean the board of directors of Merger Sub.

"***Multiemployer Plan***" shall mean (a) a "multiemployer plan," as defined in Section 3(37) or 4001(a)(3) of ERISA, or (b) a plan which if maintained or administered in or otherwise subject to the laws of the United States would be described in paragraph (a).

"***Multiple Employer Plan***" shall mean (a) a "multiple employer plan" within the meaning of Section 413(c) of the Code, or (b) a plan which if maintained or administered in or otherwise subject to the laws of the United States would be described in paragraph (a).

"***Multiple Employer Welfare Arrangement***" shall mean (a) a "multiple employer welfare arrangement" within the meaning of Section 3(40) of ERISA, or (b) a plan which if maintained or administered in or otherwise subject to the laws of the United States would be described in paragraph (a) of this definition.

"***Net Cash***" shall mean (a) the sum of (without duplication) Meerkat's cash and cash equivalents, marketable securities, accounts, interest and other receivables (to the extent determined to be collectible) and deposits (to the extent refundable to Meerkat) in each case as of the Cash Determination Time, determined in a manner consistent with the manner in which such items were historically determined and in accordance with Meerkat's audited financial statements and unaudited interim balance sheet, *minus* (b) the sum of (without duplication) (i) Meerkat's accounts payable and accrued expenses (other than accrued expenses which are Meerkat Transaction Expenses) and Meerkat's other current liabilities payable in cash, in each case as of the Cash Determination Time and determined in a manner consistent with the manner in which such items were historically determined and in accordance with Meerkat's audited financial statements and unaudited interim balance sheet, and (ii) any unpaid Meerkat Transaction Expenses, *minus* (c) any unpaid amounts payable by Meerkat in satisfaction of its obligations under Section 5.8(d) for the period after the Closing, *minus* (d) the Outstanding Lease Obligations.

"***Ordinary Course of Business***" shall mean, in the case of each of the Company and Meerkat, such actions taken in the ordinary course of its normal operations and consistent with its past practices (which, in the case of Meerkat, shall include the potential wind down of its operations and which shall be consistent in all material respects with the operating budget set forth on Schedule B).

"***Organizational Documents***" means, with respect to any Person (other than an individual), (a) the certificate or articles of association or incorporation or organization or limited partnership or limited liability company, and any joint venture, limited liability company, operating or partnership agreement and other similar documents adopted or filed in connection with the creation, formation or organization of such Person and (b) all bylaws, regulations and similar documents or agreements relating to the organization or governance of such Person, in each case, as amended or supplemented.

"***Outstanding Lease Obligations***" means all liabilities and other obligations of Meerkat whenever arising pursuant to that certain (a) Lease dated June 24, 2016 by and between G&I VII Encino Trace II LP, as landlord, and Meerkat, as tenant, with respect to space at Encino Trace, Building II, 5707 Southwest Parkway, Austin, Texas and (b) Online Office Agreement dated November 7, 2016 by and between Regus, as landlord, and Mirna Therapeutics, as tenant, with respect to space at 1250 Capital of Texas Highway South, Building 3, Suite 400, Austin, TX, in each case including any liabilities or obligations that relate to the assignment or early termination of such leases and obligations that survive such termination.

"***Party***" or "***Parties***" shall mean the Company, Merger Sub and Meerkat.

"***Permitted Alternative Agreement***" means a definitive agreement that contemplates or otherwise relates to an Acquisition Transaction that constitutes a Superior Offer.

"***Permitted Encumbrance***" shall mean : (a) any liens for current Taxes not yet due and payable or for Taxes that are being contested in good faith and for which adequate reserves have been made on the Company Unaudited Interim Balance Sheet or the Meerkat Unaudited Interim Balance Sheet, as applicable; (b) minor liens that have arisen in the Ordinary Course of Business and that do not (in any case or in the aggregate) materially detract from the value of the assets subject thereto or materially impair the operations of the Company or any of its Subsidiaries or Meerkat, as applicable; (c) statutory liens to secure obligations to landlords, lessors or renters under leases or rental agreements; (d) deposits or pledges made in connection with, or to secure payment of, workers' compensation, unemployment insurance or similar programs mandated by Law; and (e) statutory liens in favor of carriers, warehousemen, mechanics and materialmen, to secure claims for labor, materials or supplies.

"***Person***" shall mean any individual, Entity or Governmental Body.

"***Proxy Statement***" shall mean the proxy statement to be sent to Meerkat's stockholders in connection with the Meerkat Stockholders' Meeting.

"***Registration Statement***" shall mean the registration statement on Form S-4 (or any other applicable form under the Securities Act to register Meerkat Common Stock) to be filed with the SEC by Meerkat registering the public offering and sale of Meerkat Common Stock to some or all holders of Company Capital Stock in the Merger, including all shares of Meerkat Common Stock to be issued in exchange for all shares of Company Capital Stock in the Merger, as said registration statement may be amended prior to the time it is declared effective by the SEC.

"***Representatives***" shall mean directors, officers, employees, agents, attorneys, accountants, investment bankers, advisors and representatives.

"***Sarbanes-Oxley Act***" shall mean the Sarbanes-Oxley Act of 2002.

"***SEC***" shall mean the United States Securities and Exchange Commission.

"***Securities Act***" shall mean the Securities Act of 1933.

"***Subsequent Transaction***" shall mean any Acquisition Transaction (with all references to 20% in the definition of Acquisition Transaction being treated as references to 50% for these purposes).

An entity shall be deemed to be a "***Subsidiary***" of a Person if such Person directly or indirectly owns or purports to own, beneficially or of record, (a) an amount of voting securities or other interests in such entity that is sufficient to enable such Person to elect at least a majority of the members of such entity's board of directors or other governing body, or (b) at least 50% of the outstanding equity, voting, beneficial or financial interests in such Entity.

"***Superior Offer***" shall mean an unsolicited bona fide written Acquisition Proposal (with all references to 20% in the definition of Acquisition Transaction being treated as references to 90% for these purposes) that: (a) was not obtained or made as a direct or indirect result of a breach of (or in violation of) the Agreement; and (b) is on terms and conditions that the Meerkat Board or the Company Board, as applicable, determines in good faith, based on such matters that it deems relevant (including the likelihood of consummation thereof and the financing terms thereof), as well as any written offer by the other Party to the Agreement to amend the terms of the Agreement, and following consultation with its outside legal counsel and financial advisors, if any, are more favorable, from a financial point of view, to Meerkat's stockholders or the Company's stockholders, as applicable, than the terms of the Contemplated Transactions and is not subject to any financing condition (and if financing is required, such financing is then fully committed to the third party).

"***Tax***" shall mean any federal, state, local, foreign or other tax, including any income tax, franchise tax, capital gains tax, gross receipts tax, value-added tax, surtax, estimated tax, unemployment tax, national health insurance tax, excise tax, ad valorem tax, transfer tax, stamp tax, sales tax, use tax, property tax, business tax, withholding tax, payroll tax, customs duty, alternative or add-on minimum or other tax of any kind whatsoever, and including any fine, penalty, addition to tax or interest imposed by a Governmental Body with respect thereto.

"***Tax Return***" shall mean any return (including any information return), report, statement, declaration, estimate, schedule, notice, notification, form, election, certificate or other document or information, and any amendment or supplement to any of the foregoing, filed with or submitted to, or required to be filed with or submitted to, any Governmental Body in connection with the determination, assessment, collection or payment of any Tax or in connection with the administration, implementation or enforcement of or compliance with any Law relating to any Tax.

"***Treasury Regulations***" shall mean the United States Treasury regulations promulgated under the Code.

b) Each of the following terms is defined in the Section set forth opposite such term:

Term	Section
409A Plan	2.17(k)
Accounting Firm	1.6(e)
Anticipated Closing Date	1.6(a)
Capitalization Date	3.6(a)
Cash Determination Time	1.6(a)
Certificate of Merger	1.3
Certification	3.7(a)
Closing	1.3
Closing Date	1.3
Company	Preamble
Company Board Recommendation	5.2(a)
Company Disclosure Schedule	Section 2

Term	Section
Company Employee Plan	2.17(c)
Company Financials	2.7(a)
Company Intervening Event	5.2(d)
Company Material Contract	2.13
Company Plan	2.6(c)
Company Permits	2.14(b)
Company Preferred Stock	2.6(a)
Company Product Candidates	2.14(d)
Company Real Estate Leases	2.11
Company Regulatory Permits	2.14(d)
Company Stock Certificate	1.7
Company Termination Fee	9.3(b)
Costs	5.8(a)
D&O Indemnified Party	5.8(a)
Dispute Notice	1.6(b)
Dissenting Shares	1.9(a)
Drug Regulatory Agency	2.14(c)
Effective Time	1.3
End Date	9.1(b)
Exchange Agent	1.8(a)
Exchange Fund	1.8(a)
FDA	2.14(c)
FDCA	2.14(c)
GAAP	2.7(a)
Investor Agreements	5.16
Liability	2.9
Meerkat	Preamble
Meerkat Board Recommendation	5.3(b)
Meerkat Disclosure Schedule	3
Meerkat Employee Plan	3.17(c)
Meerkat Intervening Event	5.3(c)
Meerkat Leased Real Property	3.11(a)
Meerkat Material Contract	3.13
Meerkat Notice Period	5.3(c)
Meerkat Permits	3.14(b)
Meerkat Product Candidates	3.14(d)
Meerkat Regulatory Permits	3.14(d)
Meerkat Real Estate Leases	3.11
Meerkat SEC Documents	3.7(a)
Meerkat Stock Plans	3.6(c)
Meerkat Stockholders' Meeting	5.3(a)
Merger	Recitals
Merger Sub	Preamble
Net Cash Condition	8.6
Net Cash Calculation	1.6(a)
Net Cash Schedule	1.6(a)
Notice Period	5.2(d)
Pre-Closing Period	4.1(a)
Required Company Stockholder Vote	2.4
Required Meerkat Stockholder Vote	3.4
Response Date	1.6(b)
Surviving Corporation	1.1
Third Party Expenses	9.3(f)

Annex B

Wedbush Securities Inc.
Two Embarcadero Center
Suite 600
San Francisco, CA 94111

May 15, 2017

Board of Directors
Mirna Therapeutics, Inc.
1250 South Capital of Texas Highway
Building 3, Suite 400
Austin, TX 78746

Members of the Board:

You have requested our opinion as to the fairness, from a financial point of view, to the holders of common stock, par value $0.001 per share ("Mirna Common Stock"), of Mirna Therapeutics, Inc. ("Mirna"), of the Consideration (as defined below) to be paid by Mirna pursuant to the terms of the proposed Agreement and Plan of Merger (the "Merger Agreement") to be entered into among Mirna, Meerkat Merger Sub, Inc. ("Merger Sub") and Synlogic, Inc. (the "Company"). Capitalized terms used herein have the respective meanings ascribed thereto in the May 15, 2017 draft of the Merger Agreement provided to us by Mirna (the "Draft Merger Agreement").

As more specifically set forth in the Merger Agreement, and subject to the terms, conditions and adjustments set forth therein, the Merger Agreement provides for the acquisition of the Company through the merger of Merger Sub with and into the Company, with the Company as the surviving entity thereof (the "Merger"). By virtue of the Merger, each share of common stock, par value $0.0001 per share, of the Company ("Company Common Stock") issued and outstanding immediately prior to the effective time of the Merger (other than (i) shares held in the Company's treasury or owned by the Company, Merger Sub or any subsidiary of the Company and (ii) any Dissenting Shares) will be converted into the right to receive a number of shares of Mirna Common Stock equal to the Exchange Ratio. The Exchange Ratio is derived from the agreed relative percentage ownership of the combined company by holders of Company Common Stock (the "Company Allocation Percentage") and Mirna Common Stock (the "Mirna Allocation Percentage") following consummation of the Merger. The Mirna Allocation Percentage is subject to adjustment in the event that Mirna's "Net Cash" as determined pursuant to the Merger Agreement is less than or greater than $40 million. For purposes of our opinion, Mirna management has advised us and, with your consent, we have assumed without independent verification that (i) Net Cash will be $40.0 million, (ii) the Mirna Allocation Percentage will be 16.9%, (iii) and the Company Allocation Percentage will be 83.1%. We expressly disclaim any opinion as to (i) the reasonableness of these assumptions, (ii) the amount of Net Cash, (iii) the final Exchange Ratio determined pursuant to the Merger Agreement, (iv) the final Mirna Allocation Percentage, (v) the final Company Allocation Percentage, or (vi) the actual number of shares of Mirna Common Stock to be issued in the Merger. The total number of shares of Mirna Common Stock to be issued by Mirna in the Merger is referred to herein as (the "Consideration"). The Merger and the other transactions summarized above are collectively referred to as the "Transaction."

Wedbush Securities Inc. ("Wedbush") is an investment banking firm and member of The New York Stock Exchange and other principal stock exchanges in the United States, and is regularly engaged as part of its business in the valuation of businesses and their securities in connection with mergers and acquisitions, negotiated underwritings, private placements, secondary distributions of listed and unlisted securities, and valuations for corporate, estate and other purposes.

For purposes of this opinion and in connection with our review, we have, among other things: (1) reviewed the Draft Merger Agreement, and we have assumed that no changes will be made to the Merger Agreement that will be material to our analysis; (2) reviewed certain publicly available business and financial information relating to Mirna and the Company, respectively; (3) reviewed certain internal information, primarily financial in nature, including financial and operating data furnished to us by the managements of Mirna and the Company, respectively, and approved for our use by Mirna; (4) reviewed certain publicly available information with respect to other companies in the biopharmaceutical industry that we believe to be similar in certain respects, in whole or in part, to the Company; (5) considered the financial terms, to the extent publicly available, of selected recent business combinations and initial public offerings of companies in the biopharmaceutical industry that we believe to be similar in certain respects to the Company, in whole or in part, and to the Transaction; and (6) made inquiries regarding and discussed the Draft Merger Agreement and other matters related thereto with Mirna's and the Company's counsel. In addition, we have held discussions with the managements of Mirna and the Company concerning their views as to the financial and other information described above. In addition to the foregoing, we have conducted such other analyses and examinations and considered such other financial, economic and market criteria as we deem appropriate to arrive at our opinion.

In rendering this opinion, we have assumed and relied upon the accuracy and completeness of all information that was publicly available or was furnished to or discussed with us by Mirna or the Company or otherwise reviewed by us. With respect to information provided to or reviewed by us, we have been advised by the managements of Mirna and the Company that such information was reasonably prepared on bases reflecting the best currently available estimates and judgments of the management of Mirna or the Company, as applicable. We express no view as to the reasonableness of such financial information or the assumptions on which it was based.

We have further relied on the assurances of the management of Mirna that they are not aware of any facts that would make the information provided to us incomplete or misleading. Except for certain estimates of liabilities expected to be incurred by Mirna in connection with a potential liquidation of Mirna prepared by management of Mirna, we have not made or been provided with any independent evaluations or appraisals of any of the assets, properties, liabilities (including any contingent, derivative or off-balance-sheet assets or liabilities) or securities, nor have we made any physical inspection of the properties or assets, of Mirna or the Company. Further, as you are aware, the Company's management did not provide us with, and we did not otherwise have access to, financial forecasts regarding the Company's business, other than certain collaboration revenue and operating expense forecasts for the three years ended December 31, 2019, and, accordingly we did not perform either a discounted cash flow analysis or any multiples-based analyses with respect to the Company. With respect to the operating expense forecasts of the Company, upon the guidance of the managements of Mirna and the Company, we have assumed that such projections have been reasonably prepared on a basis reflecting the best currently available estimates and judgments of the management of the Company as to the future operating expenses of the Company and that the Company will perform substantially in accordance with such projections. We assume no responsibility for and we express no view as to any such projections or the assumptions on which they are based. We did not evaluate the solvency or fair value of Mirna, the Company or any of their respective subsidiaries (or the impact of the Transaction thereon) under any law relating to bankruptcy, insolvency or similar matters.

Our opinion is based on economic, market and other conditions as may exist on, and the information made available to us as of, the date hereof. We have also relied, without independent verification, on the accuracy and completeness of Mirna's and the Company's representations and warranties in the Draft Merger Agreement, without regard to any qualifications or exceptions that may be set forth in disclosure schedules, copies of which may not be complete as of the date hereof, and the information provided to us by Mirna and the Company. In addition, we have assumed that the Transaction will be consummated in accordance with the terms set forth in the Draft Merger Agreement without any waiver, amendment or delay of any terms or conditions that would be material to our analysis. Representatives of Mirna have advised us, and we have further assumed that the final terms of the Merger Agreement will not differ from the terms set forth in the Draft Merger Agreement in any respect material to our analysis. We have also assumed that all governmental, regulatory or other consents and approvals necessary for the consummation of the Transaction will be obtained without imposition of any terms or

conditions that would be material to our analysis. Events occurring after the date hereof could materially affect the assumptions used in preparing this opinion. We have not undertaken any obligation to reaffirm or revise this opinion or otherwise comment upon any events occurring after the date hereof.

We are not legal, tax or regulatory advisors and do not express any opinion as to any tax or other consequences that may arise from the Transactions, nor does our opinion address any legal, regulatory or accounting matters, as to which we understand that Mirna has obtained such advice as it deemed necessary from qualified professionals. We are financial advisors only and have relied upon, without independent verification, the assessment of Mirna and the Company and their legal, tax or regulatory advisors with respect to legal, tax or regulatory matters. We have assumed that the Transaction will have the tax effects contemplated by the Merger Agreement.

In rendering this opinion, we express no opinion as to the amount or nature of any compensation to any officers, directors, or employees of Mirna, or any class of such persons, whether relative to the Consideration to be paid in the Transaction or otherwise, or with respect to the fairness of any such compensation. We are not opining as to the merits of the Transaction as compared to any alternative transactions that may be available to Mirna. At your direction, we have not been asked to, nor do we offer, any opinion as to the terms, other than the Consideration to be paid by Mirna to the extent expressly specified herein, of the Merger Agreement or the form of the Transaction. Nor do we express any opinion with respect to the terms of any other agreement entered into or to be entered into in connection with the Transaction. We express no opinion as to the price at which shares of Mirna Common Stock may trade at any time subsequent to the announcement or consummation of the Transaction.

Mirna has agreed to pay Wedbush fees for its services as exclusive financial advisor to Mirna in connection with the Transaction. Additionally, we will receive a fee for rendering this opinion, which will be creditable against the advisory fee related to our role as exclusive financial advisor. The fee for rendering this opinion is not contingent upon the conclusions reached in this opinion. A portion of such fees becomes payable upon delivery of this opinion and the substantial portion of such fees will become payable upon consummation of the Transaction. In addition, Mirna has agreed to reimburse us for our reasonable out-of-pocket expenses, subject to certain limitations, and to indemnify us for certain liabilities arising out of our engagement. We may also provide investment banking and financial advisory services to Mirna, the Company and their respective affiliates in the future for which we would expect to receive customary fees.

In the ordinary course of our business, Wedbush and our affiliates may actively trade Mirna Common Stock or other instruments or obligations of Mirna for our own account and for the accounts of our customers and, accordingly, we may at any time hold a long or short position in Mirna Common Stock or such instruments or obligations of Mirna.

This opinion is solely for the benefit and use of the board of directors of Mirna (in its capacity as such) in connection with its consideration of the Transaction and does not constitute a recommendation to the board of directors of Mirna or to any holder of Mirna Common Stock as to how such holder should vote with respect to the Transaction or otherwise. This opinion may not be used for any other purpose without our prior written consent in each instance, except as expressly provided for in the engagement letter dated as of November 23, 2016, between Mirna and Wedbush.

This opinion was approved by a fairness committee at Wedbush in accordance with the requirements of FINRA Rule 5150.

Based upon and subject to the foregoing, it is our opinion that, as of the date hereof, the Consideration to be paid by Mirna in the Transaction is fair, from a financial point of view, to the holders of Mirna Common Stock.

Very truly yours,

/s/ Wedbush Securities Inc.

Wedbush Securities Inc.

Annex C

SECTION 262 OF THE GENERAL CORPORATION LAW OF THE STATE OF DELAWARE

§ 262. Appraisal rights.

(a) Any stockholder of a corporation of this State who holds shares of stock on the date of the making of a demand pursuant to subsection (d) of this section with respect to such shares, who continuously holds such shares through the effective date of the merger or consolidation, who has otherwise complied with subsection (d) of this section and who has neither voted in favor of the merger or consolidation nor consented thereto in writing pursuant to § 228 of this title shall be entitled to an appraisal by the Court of Chancery of the fair value of the stockholder's shares of stock under the circumstances described in subsections (b) and (c) of this section. As used in this section, the word "stockholder" means a holder of record of stock in a corporation; the words "stock" and "share" mean and include what is ordinarily meant by those words; and the words "depository receipt" mean a receipt or other instrument issued by a depository representing an interest in 1 or more shares, or fractions thereof, solely of stock of a corporation, which stock is deposited with the depository.

(b) Appraisal rights shall be available for the shares of any class or series of stock of a constituent corporation in a merger or consolidation to be effected pursuant to § 251 (other than a merger effected pursuant to § 251(g) of this title and, subject to paragraph (b)(3) of this section, § 251(h) of this title), § 252, § 254, § 255, § 256, § 257, § 258, § 263 or § 264 of this title:

(1) Provided, however, that, except as expressly provided in § 363(b) of this title, no appraisal rights under this section shall be available for the shares of any class or series of stock, which stock, or depository receipts in respect thereof, at the record date fixed to determine the stockholders entitled to receive notice of the meeting of stockholders to act upon the agreement of merger or consolidation, were either: (i) listed on a national securities exchange or (ii) held of record by more than 2,000 holders; and further provided that no appraisal rights shall be available for any shares of stock of the constituent corporation surviving a merger if the merger did not require for its approval the vote of the stockholders of the surviving corporation as provided in § 251(f) of this title.

(2) Notwithstanding paragraph (b)(1) of this section, appraisal rights under this section shall be available for the shares of any class or series of stock of a constituent corporation if the holders thereof are required by the terms of an agreement of merger or consolidation pursuant to §§ 251, 252, 254, 255, 256, 257, 258, 263 and 264 of this title to accept for such stock anything except:

a. Shares of stock of the corporation surviving or resulting from such merger or consolidation, or depository receipts in respect thereof;

b. Shares of stock of any other corporation, or depository receipts in respect thereof, which shares of stock (or depository receipts in respect thereof) or depository receipts at the effective date of the merger or consolidation will be either listed on a national securities exchange or held of record by more than 2,000 holders;

c. Cash in lieu of fractional shares or fractional depository receipts described in the foregoing paragraphs (b)(2)a. and b. of this section; or

d. Any combination of the shares of stock, depository receipts and cash in lieu of fractional shares or fractional depository receipts described in the foregoing paragraphs (b)(2)a., b. and c. of this section.

(3) In the event all of the stock of a subsidiary Delaware corporation party to a merger effected under § 251(h), § 253 or § 267 of this title is not owned by the parent immediately prior to the merger, appraisal rights shall be available for the shares of the subsidiary Delaware corporation.

(4) In the event of an amendment to a corporation's certificate of incorporation contemplated by § 363(a) of this title, appraisal rights shall be available as contemplated by § 363(b) of this title, and the procedures of

this section, including those set forth in subsections (d) and (e) of this section, shall apply as nearly as practicable, with the word "amendment" substituted for the words "merger or consolidation," and the word "corporation" substituted for the words "constituent corporation" and/or "surviving or resulting corporation."

(c) Any corporation may provide in its certificate of incorporation that appraisal rights under this section shall be available for the shares of any class or series of its stock as a result of an amendment to its certificate of incorporation, any merger or consolidation in which the corporation is a constituent corporation or the sale of all or substantially all of the assets of the corporation. If the certificate of incorporation contains such a provision, the provisions of this section, including those set forth in subsections (d), (e), and (g) of this section, shall apply as nearly as is practicable.

(d) Appraisal rights shall be perfected as follows:

(1) If a proposed merger or consolidation for which appraisal rights are provided under this section is to be submitted for approval at a meeting of stockholders, the corporation, not less than 20 days prior to the meeting, shall notify each of its stockholders who was such on the record date for notice of such meeting (or such members who received notice in accordance with § 255(c) of this title) with respect to shares for which appraisal rights are available pursuant to subsection (b) or (c) of this section that appraisal rights are available for any or all of the shares of the constituent corporations, and shall include in such notice a copy of this section and, if 1 of the constituent corporations is a nonstock corporation, a copy of § 114 of this title. Each stockholder electing to demand the appraisal of such stockholder's shares shall deliver to the corporation, before the taking of the vote on the merger or consolidation, a written demand for appraisal of such stockholder's shares. Such demand will be sufficient if it reasonably informs the corporation of the identity of the stockholder and that the stockholder intends thereby to demand the appraisal of such stockholder's shares. A proxy or vote against the merger or consolidation shall not constitute such a demand. A stockholder electing to take such action must do so by a separate written demand as herein provided. Within 10 days after the effective date of such merger or consolidation, the surviving or resulting corporation shall notify each stockholder of each constituent corporation who has complied with this subsection and has not voted in favor of or consented to the merger or consolidation of the date that the merger or consolidation has become effective; or

(2) If the merger or consolidation was approved pursuant to § 228, § 251(h), § 253, or § 267 of this title, then either a constituent corporation before the effective date of the merger or consolidation or the surviving or resulting corporation within 10 days thereafter shall notify each of the holders of any class or series of stock of such constituent corporation who are entitled to appraisal rights of the approval of the merger or consolidation and that appraisal rights are available for any or all shares of such class or series of stock of such constituent corporation, and shall include in such notice a copy of this section and, if 1 of the constituent corporations is a nonstock corporation, a copy of § 114 of this title. Such notice may, and, if given on or after the effective date of the merger or consolidation, shall, also notify such stockholders of the effective date of the merger or consolidation. Any stockholder entitled to appraisal rights may, within 20 days after the date of mailing of such notice or, in the case of a merger approved pursuant to § 251(h) of this title, within the later of the consummation of the offer contemplated by § 251(h) of this title and 20 days after the date of mailing of such notice, demand in writing from the surviving or resulting corporation the appraisal of such holder's shares. Such demand will be sufficient if it reasonably informs the corporation of the identity of the stockholder and that the stockholder intends thereby to demand the appraisal of such holder's shares. If such notice did not notify stockholders of the effective date of the merger or consolidation, either (i) each such constituent corporation shall send a second notice before the effective date of the merger or consolidation notifying each of the holders of any class or series of stock of such constituent corporation that are entitled to appraisal rights of the effective date of the merger or consolidation or (ii) the surviving or resulting corporation shall send such a second notice to all such holders on or within 10 days after such effective date; provided, however, that if such second notice is sent more than 20 days following the sending of the first notice or, in the case of a merger approved pursuant to

§ 251(h) of this title, later than the later of the consummation of the offer contemplated by § 251(h) of this title and 20 days following the sending of the first notice, such second notice need only be sent to each stockholder who is entitled to appraisal rights and who has demanded appraisal of such holder's shares in accordance with this subsection. An affidavit of the secretary or assistant secretary or of the transfer agent of the corporation that is required to give either notice that such notice has been given shall, in the absence of fraud, be prima facie evidence of the facts stated therein. For purposes of determining the stockholders entitled to receive either notice, each constituent corporation may fix, in advance, a record date that shall be not more than 10 days prior to the date the notice is given, provided, that if the notice is given on or after the effective date of the merger or consolidation, the record date shall be such effective date. If no record date is fixed and the notice is given prior to the effective date, the record date shall be the close of business on the day next preceding the day on which the notice is given.

(e) Within 120 days after the effective date of the merger or consolidation, the surviving or resulting corporation or any stockholder who has complied with subsections (a) and (d) of this section hereof and who is otherwise entitled to appraisal rights, may commence an appraisal proceeding by filing a petition in the Court of Chancery demanding a determination of the value of the stock of all such stockholders. Notwithstanding the foregoing, at any time within 60 days after the effective date of the merger or consolidation, any stockholder who has not commenced an appraisal proceeding or joined that proceeding as a named party shall have the right to withdraw such stockholder's demand for appraisal and to accept the terms offered upon the merger or consolidation. Within 120 days after the effective date of the merger or consolidation, any stockholder who has complied with the requirements of subsections (a) and (d) of this section hereof, upon written request, shall be entitled to receive from the corporation surviving the merger or resulting from the consolidation a statement setting forth the aggregate number of shares not voted in favor of the merger or consolidation and with respect to which demands for appraisal have been received and the aggregate number of holders of such shares. Such written statement shall be mailed to the stockholder within 10 days after such stockholder's written request for such a statement is received by the surviving or resulting corporation or within 10 days after expiration of the period for delivery of demands for appraisal under subsection (d) of this section hereof, whichever is later. Notwithstanding subsection (a) of this section, a person who is the beneficial owner of shares of such stock held either in a voting trust or by a nominee on behalf of such person may, in such person's own name, file a petition or request from the corporation the statement described in this subsection.

(f) Upon the filing of any such petition by a stockholder, service of a copy thereof shall be made upon the surviving or resulting corporation, which shall within 20 days after such service file in the office of the Register in Chancery in which the petition was filed a duly verified list containing the names and addresses of all stockholders who have demanded payment for their shares and with whom agreements as to the value of their shares have not been reached by the surviving or resulting corporation. If the petition shall be filed by the surviving or resulting corporation, the petition shall be accompanied by such a duly verified list. The Register in Chancery, if so ordered by the Court, shall give notice of the time and place fixed for the hearing of such petition by registered or certified mail to the surviving or resulting corporation and to the stockholders shown on the list at the addresses therein stated. Such notice shall also be given by 1 or more publications at least 1 week before the day of the hearing, in a newspaper of general circulation published in the City of Wilmington, Delaware or such publication as the Court deems advisable. The forms of the notices by mail and by publication shall be approved by the Court, and the costs thereof shall be borne by the surviving or resulting corporation.

(g) At the hearing on such petition, the Court shall determine the stockholders who have complied with this section and who have become entitled to appraisal rights. The Court may require the stockholders who have demanded an appraisal for their shares and who hold stock represented by certificates to submit their certificates of stock to the Register in Chancery for notation thereon of the pendency of the appraisal proceedings; and if any stockholder fails to comply with such direction, the Court may dismiss the proceedings as to such stockholder. If immediately before the merger or consolidation the shares of the class or series of stock of the constituent corporation as to which appraisal rights are available were listed on a national securities exchange, the Court shall dismiss the proceedings

as to all holders of such shares who are otherwise entitled to appraisal rights unless (1) the total number of shares entitled to appraisal exceeds 1% of the outstanding shares of the class or series eligible for appraisal, (2) the value of the consideration provided in the merger or consolidation for such total number of shares exceeds $1 million, or (3) the merger was approved pursuant to § 253 or § 267 of this title.

(h) After the Court determines the stockholders entitled to an appraisal, the appraisal proceeding shall be conducted in accordance with the rules of the Court of Chancery, including any rules specifically governing appraisal proceedings. Through such proceeding the Court shall determine the fair value of the shares exclusive of any element of value arising from the accomplishment or expectation of the merger or consolidation, together with interest, if any, to be paid upon the amount determined to be the fair value. In determining such fair value, the Court shall take into account all relevant factors. Unless the Court in its discretion determines otherwise for good cause shown, and except as provided in this subsection, interest from the effective date of the merger through the date of payment of the judgment shall be compounded quarterly and shall accrue at 5% over the Federal Reserve discount rate (including any surcharge) as established from time to time during the period between the effective date of the merger and the date of payment of the judgment. At any time before the entry of judgment in the proceedings, the surviving corporation may pay to each stockholder entitled to appraisal an amount in cash, in which case interest shall accrue thereafter as provided herein only upon the sum of (1) the difference, if any, between the amount so paid and the fair value of the shares as determined by the Court, and (2) interest theretofore accrued, unless paid at that time. Upon application by the surviving or resulting corporation or by any stockholder entitled to participate in the appraisal proceeding, the Court may, in its discretion, proceed to trial upon the appraisal prior to the final determination of the stockholders entitled to an appraisal. Any stockholder whose name appears on the list filed by the surviving or resulting corporation pursuant to subsection (f) of this section and who has submitted such stockholder's certificates of stock to the Register in Chancery, if such is required, may participate fully in all proceedings until it is finally determined that such stockholder is not entitled to appraisal rights under this section.

(i) The Court shall direct the payment of the fair value of the shares, together with interest, if any, by the surviving or resulting corporation to the stockholders entitled thereto. Payment shall be so made to each such stockholder, in the case of holders of uncertificated stock forthwith, and the case of holders of shares represented by certificates upon the surrender to the corporation of the certificates representing such stock. The Court's decree may be enforced as other decrees in the Court of Chancery may be enforced, whether such surviving or resulting corporation be a corporation of this State or of any state.

(j) The costs of the proceeding may be determined by the Court and taxed upon the parties as the Court deems equitable in the circumstances. Upon application of a stockholder, the Court may order all or a portion of the expenses incurred by any stockholder in connection with the appraisal proceeding, including, without limitation, reasonable attorney's fees and the fees and expenses of experts, to be charged pro rata against the value of all the shares entitled to an appraisal.

(k) From and after the effective date of the merger or consolidation, no stockholder who has demanded appraisal rights as provided in subsection (d) of this section shall be entitled to vote such stock for any purpose or to receive payment of dividends or other distributions on the stock (except dividends or other distributions payable to stockholders of record at a date which is prior to the effective date of the merger or consolidation); provided, however, that if no petition for an appraisal shall be filed within the time provided in subsection (e) of this section, or if such stockholder shall deliver to the surviving or resulting corporation a written withdrawal of such stockholder's demand for an appraisal and an acceptance of the merger or consolidation, either within 60 days after the effective date of the merger or consolidation as provided in subsection (e) of this section or thereafter with the written approval of the corporation, then the right of such stockholder to an appraisal shall cease. Notwithstanding the foregoing, no appraisal proceeding in the Court of Chancery shall be dismissed as to any stockholder without the approval of the Court, and such approval may be conditioned upon such terms as the Court deems just; provided, however that this provision shall not affect the right of any stockholder who has not commenced an appraisal proceeding or joined that proceeding as a named party to withdraw such stockholder's

demand for appraisal and to accept the terms offered upon the merger or consolidation within 60 days after the effective date of the merger or consolidation, as set forth in subsection (e) of this section.

(l) The shares of the surviving or resulting corporation to which the shares of such objecting stockholders would have been converted had they assented to the merger or consolidation shall have the status of authorized and unissued shares of the surviving or resulting corporation.

Annex D

CERTIFICATE OF AMENDMENT
TO THE
AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
MIRNA THERAPEUTICS, INC.

Mirna Therapeutics, Inc. (the "***Corporation***"), a corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware, as amended (the "***DGCL***"), hereby certifies as follows:

A. The name of the Corporation is Mirna Therapeutics, Inc., and the original certificate of incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on December 20, 2007. An Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on November 3, 2009. A Second Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on December 4, 2009. A Third Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on August 10, 2011. A Fourth Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on October 22, 2012. A Fifth Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on March 21, 2014. A Sixth Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on March 27, 2015. A Seventh Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on September 29, 2015. An Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on October 5, 2015 (the "***Prior Certificate***").

B. This Certificate of Amendment to the Amended and Restated Certificate of Incorporation (the "***Certificate of Amendment***") amends the Prior Certificate, and has been duly adopted by the Corporation's Board of Directors and stockholders in accordance with the provisions of Sections 141, 211 and 242 of the DGCL.

C. Article IV of the Prior Certificate is hereby amended to add the following Section C:

"C. Immediately upon the filing of this Certificate of Amendment of Amended and Restated Certificate of Incorporation with the Secretary of State of the State of Delaware each one (1) share of Common Stock outstanding immediately prior to such filing shall be automatically reclassified into of one share of Common Stock. The aforementioned reclassification shall be referred to collectively as the "***Reverse Split***."

The Reverse Split shall occur without any further action on the part of the Corporation or stockholders of the Corporation and whether or not certificates representing such stockholders' shares prior to the Reverse Split are surrendered for cancellation. No fractional interest in a share of Common Stock shall be deliverable upon the Reverse Split. All shares of Common Stock (including fractions thereof) issuable upon the Reverse Split held by a holder prior to the Reverse Split shall be aggregated for purposes of determining whether the Reverse Split would result in the issuance of any fractional share. Any fractional share resulting from such aggregation upon the Reverse Split shall be rounded down to the nearest whole number. Each holder who would otherwise be entitled to a fraction of a share of Common Stock upon the Reverse Split (after aggregating all fractions of a share to which such stockholder would otherwise be entitled) shall, in lieu thereof, be entitled to receive a cash payment in an amount equal to the fraction to which the stockholder would otherwise be entitled multiplied by the closing price of the Corporation's Common Stock as reported on The NASDAQ Global Market on the trading day immediately preceding the filing of this Certificate of Amendment of Amended and

Restated Certificate of Incorporation with the Secretary of State of the State of Delaware. The Corporation shall not be obliged to issue certificates evidencing the shares of Common Stock outstanding as a result of the Reverse Split unless and until the certificates evidencing the shares held by a holder prior to the Reverse Split are either delivered to the Corporation or its transfer agent, or the holder notifies the Corporation or its transfer agent that such certificates have been lost, stolen or destroyed and executes an agreement satisfactory to the Corporation to indemnify the Corporation from any loss incurred by it in connection with such certificates."

D. The Certificate of Amendment so adopted reads in full as set forth above and is hereby incorporated by reference. All other provisions of the Prior Certificate remain in full force and effect.

IN WITNESS WHEREOF, Mirna Therapeutics, Inc. has caused this Certificate of Amendment to be signed by Paul Lammers, M.D., M.Sc., a duly authorized officer of the Corporation, on , 2017.

MIRNA THERAPEUTICS, INC.

By : _____
Name: Paul Lammers, M.D., M.Sc.
Title: President and Chief Executive Officer

Annex E

CERTIFICATE OF AMENDMENT
TO THE
AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
MIRNA THERAPEUTICS, INC.

Mirna Therapeutics, Inc. (the "***Corporation***"), a corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware, as amended (the "***DGCL***"), hereby certifies as follows:

A. The name of the Corporation is Mirna Therapeutics, Inc., and the original certificate of incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on December 20, 2007. An Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on November 3, 2009. A Second Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on December 4, 2009. A Third Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on August 10, 2011. A Fourth Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on October 22, 2012. A Fifth Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on March 21, 2014. A Sixth Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on March 27, 2015. A Seventh Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on September 29, 2015. An Amended and Restated Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on October 5, 2015 (the "***Prior Certificate***").

B. This Certificate of Amendment to the Amended and Restated Certificate of Incorporation (the "***Certificate of Amendment***") amends the Prior Certificate, and has been duly adopted by the Corporation's Board of Directors and stockholders in accordance with the provisions of Sections 141, 211 and 242 of the DGCL.

C. Article I of the Prior Certificate is hereby amended and restated to read as follows:

"ARTICLE I

"The name of the corporation is Synlogic, Inc. (the "**Corporation**")."

D. The Certificate of Amendment so adopted reads in full as set forth above and is hereby incorporated by reference. All other provisions of the Prior Certificate remain in full force and effect.

IN WITNESS WHEREOF, Mirna Therapeutics, Inc. has caused this Certificate of Amendment to be signed by Paul Lammers, M.D., M.Sc., a duly authorized officer of the Corporation, on , 2017.

MIRNA THERAPEUTICS, INC.

By : _____
Name: Paul Lammers, M.D., M.Sc.
Title: President and Chief Executive Officer

PART II

INFORMATION NOT REQUIRED IN PROXY STATEMENT/PROSPECTUS/INFORMATION STATEMENT

Item 20. Indemnification of Directors and Officers

Subsection (a) of Section 145 of the General Corporation Law of the State of Delaware ("DGCL"), empowers a corporation to indemnify any person who was or is a party or who is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation) by reason of the fact that the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with such action, suit or proceeding if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe the person's conduct was unlawful.

Subsection (b) of Section 145 empowers a corporation to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor by reason of the fact that the person acted in any of the capacities set forth above, against expenses (including attorneys' fees) actually and reasonably incurred by the person in connection with the defense or settlement of such action or suit if the person acted in good faith and in a manner the person reasonably believed to be in or not opposed to the best interests of the corporation, except that no indemnification shall be made in respect of any claim, issue or matter as to which such person shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or the court in which such action or suit was brought shall determine upon application that, despite the adjudication of liability but in view of all the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

Section 145 further provides that to the extent a director or officer of a corporation has been successful on the merits or otherwise in the defense of any action, suit or proceeding referred to in subsections (a) and (b) of Section 145, or in defense of any claim, issue or matter therein, such person shall be indemnified against expenses (including attorneys' fees) actually and reasonably incurred by such person in connection therewith; that indemnification provided for by Section 145 shall not be deemed exclusive of any other rights to which the indemnified party may be entitled; and the indemnification provided for by Section 145 shall, unless otherwise provided when authorized or ratified, continue as to a person who has ceased to be a director, officer, employee or agent and shall inure to the benefit of such person's heirs, executors and administrators. Section 145 also empowers the corporation to purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against such person and incurred by such person in any such capacity, or arising out of his status as such, whether or not the corporation would have the power to indemnify such person against such liabilities under Section 145.

Section 102(b)(7) of the DGCL provides that a corporation's certificate of incorporation may contain a provision eliminating or limiting the personal liability of a director to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director, provided that such provision shall not eliminate or limit the liability of a director (i) for any breach of the director's duty of loyalty to the corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) under Section 174 of the DGCL or (iv) for any transaction from which the director derived an improper personal benefit.

Mirna's amended and restated certificate of incorporation provides that Mirna, to the fullest extent permitted by law, shall indemnify and advance expenses to any person made or threatened to be made a party to an action, suit or proceeding, whether criminal, civil, administrative or investigative, by reason of the fact that he or she, or his or her testator or intestate, is or was a director or officer of Mirna or any predecessor of Mirna, or serves or served at any other enterprise as a director or officer at the request of Mirna or any predecessor to Mirna. Mirna's amended and restated bylaws provide that Mirna shall indemnify and hold harmless, to the fullest extent permitted by the DGCL as it presently exists or may hereafter be amended, any director or officer of Mirna who was or is made or is threatened to be made a party or is otherwise involved in any action, suit or proceeding, whether civil, criminal administrative or investigative, by reason of the fact that he or she, or a person for whom he or she is the legal representative, is or was a director or officer of the corporation or is or was serving at the request of Mirna as a director, officer, employee or agent of another corporation or of a partnership, joint venture, trust, enterprise or nonprofit entity, including service with respect to employee benefit plans, against all liability and loss suffered and expenses (including attorneys' fees) reasonably incurred by such person.

Mirna entered into indemnification agreements with each of its directors and executive officers, in addition to the indemnification provided for in its amended and restated certificate of incorporation and bylaws, and intends to enter into indemnification agreements with any new directors and executive officers in the future.

Mirna has purchased and intends to maintain insurance on behalf of any person who is or was a director or officer of Mirna against any loss arising from any claim asserted against him or her and incurred by him or her in any such capacity, subject to certain inclusions.

Pursuant to the terms of the Merger Agreement, from the Effective Time through the sixth anniversary of the date on which the Effective Time occurs, Mirna must indemnify and hold harmless each person who is now, or has been at any time prior to the date thereof, or who becomes prior to the Effective Time, a director or officer of Mirna or Synlogic, respectively, against all claims, losses, liabilities, damages, judgments, fines and reasonable fees, costs and expenses, including attorneys' fees and disbursements, incurred in connection with any claim, action, suit, proceeding or investigation to the fullest extent permitted under the DGCL. Each such person will also be entitled to advancement of expenses incurred in the defense of any such claim, action, suit, proceeding or investigation, provided that such person provides an undertaking required by the DGCL, to repay such advances if it is ultimately determined that such person is not entitled to indemnification. From and after the Effective Time, Mirna must maintain directors' and officers' liability insurance policies, with an effective date as of the closing date of the Merger, on commercially available terms and conditions and with coverage limits customary for U.S. public companies similarly situated to Mirna. In addition, Mirna shall purchase, prior to the Effective Time, a six-year prepaid "tail policy" for the non-cancellable extension of the directors' and officers' liability coverage of Mirna's existing directors' and officers' insurance policies with terms, conditions, retentions and limits of liability that are no less favorable than the current directors' and officers' liability insurance policies maintained by Mirna.

Further, pursuant to the terms of the Merger Agreement, the provisions of the amended and restated certificate of incorporation and bylaws of Mirna with respect to indemnification, advancement of expenses and exculpation of present and former directors and officers of Mirna shall not be amended, modified or repealed for a period of six years from the Effective Time in a manner that would adversely affect the rights thereunder of individuals who, at or prior to the Effective Time, were officers and directors of Mirna, unless such modification is required by applicable law.

Item 21. Exhibits and Financial Statement Schedules

(a) Exhibit Index

A list of exhibits filed with this registration statement on Form S-4 is set forth on the Exhibit Index and is incorporated herein by reference.

(b) Financial Statements

The financial statements filed with this registration statement on Form S-4 is set forth on the Financial Statement Index and is incorporated herein by reference.

Item 22. Undertakings

(a) The undersigned registrant hereby undertakes as follows:

(1) That prior to any public reoffering of the securities registered hereunder through use of a proxy statement/prospectus/information statement which is a part of this registration statement, by any person or party who is deemed to be an underwriter within the meaning of Rule 145(c), the issuer undertakes that such reoffering proxy statement/prospectus/information statement will contain the information called for by the applicable registration form with respect to reofferings by persons who may be deemed underwriters, in addition to the information called for by the other items of the applicable form.

(2) That every proxy statement/prospectus/information statement (i) that is filed pursuant to paragraph (a)(1) immediately preceding, or (ii) that purports to meet the requirements of Section 10(a)(3) of the Securities Act and is used in connection with an offering of securities subject to Rule 415, will be filed as a part of an amendment to the registration statement and will not be used until such amendment is effective, and that, for purposes of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To respond to requests for information that is incorporated by reference into this proxy statement/prospectus/information statement pursuant to Item 4, 10(b), 11, or 13 of this Form, within one business day of receipt of such request, and to send the incorporated documents by first class mail or other equally prompt means. This includes information contained in documents filed subsequent to the effective date of the registration statement through the date of responding to the request.

(4) To supply by means of a post-effective amendment all information concerning a transaction, and the company being acquired involved therein, that was not the subject of and included in the registration statement when it became effective.

(b) Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized in the city of Austin, State of Texas, on the 21st day of June, 2017.

MIRNA THERAPEUTICS, INC.

/s/ Paul Lammers
Paul Lammers, M.D., M.Sc.
President and Chief Executive Officer

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints each of Paul Lammers and Alan Fuhrman his true and lawful attorney-in-fact and agent, with full power of substitution, for him and in his name, place and stead, in any and all capacities, to sign any and all amendments to this registration statement on Form S-4, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorney-in-fact and agent, or his substitutes or substitute, may lawfully do or cause to be done by virtue hereof.

IN WITNESS WHEREOF, each of the undersigned has executed this Power of Attorney as of the date indicated opposite his/her name.

Pursuant to the requirements of the Securities Act, this registration statement has been signed by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Paul Lammers Paul Lammers, M.D., M.Sc.	Director, President and Chief Executive Officer (Principal Executive Officer)	June 21, 2017
/s/ Alan Fuhrman Alan Fuhrman	Chief Financial Officer (Principal Financial and Accounting Officer)	June 21, 2017
/s/ Michael Powell Michael Powell, Ph.D.	Chairman of the Board	June 21, 2017
/s/ Lawrence M. Alleva Lawrence M. Alleva	Director	June 21, 2017
/s/ Edward Mathers Edward Mathers	Director	June 21, 2017
/s/ Matthew Winkler Matthew Winkler, Ph.D.	Director	June 21, 2017
/s/ Peter Greenleaf Peter Greenleaf	Director	June 21, 2017
/s/ Perry Nisen Perry Nisen, M.D., Ph.D.	Director	June 21, 2017

EXHIBIT INDEX

Exhibit Number	Description of Document
2.1	Agreement and Plan of Merger and Reorganization, dated as of May 15, 2017, by and among Mirna Therapeutics, Inc., Meerkat Merger Sub, Inc. and Synlogic, Inc. (included as *Annex A* to the proxy statement/prospectus/information statement forming a part of this Registration Statement).
2.2	Form of Support Agreement between Mirna Therapeutics, Inc. and certain stockholders of Synlogic, Inc. (included in *Annex A* to the proxy statement/prospectus/information statement forming a part of this Registration Statement).
2.3	Form of Support Agreement between Synlogic, Inc. and certain stockholders of Mirna Therapeutics, Inc. (included in *Annex A* to the proxy statement/prospectus/information statement forming a part of this Registration Statement).
2.3	Form of Lock-up Agreement, by and between Synlogic, Inc. and certain stockholders of Mirna Therapeutics, Inc. (included in *Annex A* to the proxy statement/prospectus/information statement forming a part of this Registration Statement).
2.4	Form of Lock-up Agreement, by and between Mirna Therapeutics, Inc. and certain security holders of Mirna Therapeutics, Inc. and Synlogic, Inc. (included in *Annex A* to the proxy statement/prospectus/information statement forming a part of this Registration Statement).
3.1	Amended and Restated Certificate of Incorporation of Mirna Therapeutics, Inc. (incorporated by reference from the Current Report on Form 8-K filed with the Securities and Exchange Commission on October 6, 2015).
3.2	Amended and Restated Bylaws of Mirna Therapeutics, Inc. (incorporated by reference from the Current Report on Form 8-K filed with the Securities and Exchange Commission on October 6, 2015).
4.1	Form of Common Stock certificate of Mirna Therapeutics, Inc. (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 18, 2015).
5.1*	Opinion of Latham & Watkins LLP regarding the validity of the securities.
10.1	Registration Rights Agreement, dated October 5, 2015, by and between Mirna Therapeutics, Inc. and the Cancer Prevention and Research Institute of Texas (incorporated by reference from the Current Report on Form 8-K filed with the Securities and Exchange Commission on October 6, 2015).
10.2(A)	Lease Agreement, dated as of June 24, 2016, between G&I VII Encino Trace II LP and Mirna Therapeutics, Inc. (incorporated by reference from the Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission on August 15, 2016).
10.2(B)	Lease Termination Agreement and Release, dated as of May 5, 2017, between G&I VII Encino Trace II LP and Mirna Therapeutics, Inc.
10.3(A)†	Cancer Research Grant Contract, dated August 31, 2010, by and between Mirna Therapeutics, Inc. and the Cancer Prevention and Research Institute of Texas (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on August 24, 2015).
10.3(B)	Amendment to the Cancer Research Grant Contract, dated May 11, 2017, by and between Mirna Therapeutics, Inc. and the Cancer Prevention and Research Institute of Texas.
10.4(A)	Cancer Research Grant Contract, dated September 1, 2015, by and between Mirna Therapeutics, Inc. and the Cancer Prevention and Research Institute of Texas (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 11, 2015).

Exhibit Number	Description of Document
10.4(B)	Amendment to the Cancer Research Grant Contract, dated May 11, 2017, by and between Mirna Therapeutics, Inc. and the Cancer Prevention and Research Institute of Texas.
10.5	Stock Purchase Agreement, dated September 1, 2015, by and between Mirna Therapeutics, Inc. and the Cancer Prevention and Research Institute of Texas (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 11, 2015).
10.6	Letter Agreement, dated May 11, 2017, by and between Mirna Therapeutics, Inc. and the Cancer Prevention and Research Institute of Texas.
10.7†	Patent License Agreement, dated December 31, 2015, by and between Rosetta Genomics Ltd. and Mirna Therapeutics, Inc. (incorporated by reference from the Annual Report on Form 10-K filed with the Securities and Exchange Commission on March 29, 2016).
10.8(A)#	2008 Long Term Incentive Plan, as amended (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on August 24, 2015).
10.8(B)#	Form of Notice of Stock Option Grant under 2008 Long Term Incentive Plan (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on August 24, 2015).
10.8(C)#	Form of Stock Option Agreement under 2008 Long Term Incentive Plan (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on August 24, 2015).
10.9(A)#	2015 Equity Incentive Award Plan (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 18, 2015).
10.9(B)#	Form of Stock Option Grant Notice and Stock Option Agreement under the 2015 Equity Incentive Award Plan (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 11, 2015).
10.9(C)#	Form of Restricted Stock Award Agreement and Restricted Stock Unit Award Grant Notice under the 2015 Equity Incentive Award Plan (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 11, 2015).
10.10#	2015 Employee Stock Purchase Plan (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 18, 2015).
10.11#	Non-Employee Director Compensation Program (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 18, 2015).
10.12#	Form of Change in Control Severance Agreement (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 11, 2015).
10.13#	Form of Indemnification Agreement (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 11, 2015).
10.14(A)#	Employment Agreement, dated November 4, 2009, by and between Mirna Therapeutics, Inc. and Paul Lammers, M.D., M.Sc. (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 11, 2015).
10.14(B)#	First Amendment to Employment Agreement, dated January 5, 2011, by and between Mirna Therapeutics, Inc. and Paul Lammers, M.D., M.Sc. (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 11, 2015).
10.15#	Transition and Separation Agreement, dated as of May 13, 2016, by and between Sinil Kim, M.D. and Mirna Therapeutics, Inc. (incorporated by reference from the Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission on August 15, 2016).

Exhibit Number	Description of Document
10.16#	Employment Agreement, dated March 1, 2014, by and between Mirna Therapeutics, Inc. and Casi DeYoung (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 11, 2015).
10.17(A)#	Offer Letter, dated August 31, 2015, by and between Mirna Therapeutics, Inc. and Alan Fuhrman (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 18, 2015).
10.17(B)#	Employment Agreement, dated September 8, 2015, by and between Mirna Therapeutics, Inc. and Alan Fuhrman (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 18, 2015).
10.18#	Separation Agreement, dated December 2, 2016, by and between Jon Irvin and Mirna Therapeutics, Inc. (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 18, 2015).
10.19(A)#	Offer Letter, dated September 17, 2015, by and between Mirna Therapeutics, Inc. and Miguel Barbosa, Ph.D. (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 18, 2015).
10.19(B)#	Employment Agreement, dated September 23, 2015, by and between Mirna Therapeutics, Inc. and Miguel Barbosa, Ph.D. (incorporated by reference from the Registration Statement on Form S-1 filed with the Securities and Exchange Commission on September 25, 2015).
10.19(C)#	Separation Agreement, dated June 29, 2016, by and between Miguel Barbosa, Ph.D. and Mirna Therapeutics, Inc. (incorporated by reference from the Quarterly Report on Form 10-Q filed with the Securities and Exchange Commission on August 15, 2016).
10.20(A)#	Offer Letter, dated March 31, 2016, by and between Mirna Therapeutics, Inc. and Vincent O'Neill, M.D. (incorporated by reference from the Annual Report on Form 10-K filed with the Securities and Exchange Commission on March 15, 2017).
10.20(B)#	Employment Agreement, dated April 27, 2016, by and between Mirna Therapeutics, Inc. and Vincent O'Neill, M.D. (incorporated by reference from the Annual Report on Form 10-K filed with the Securities and Exchange Commission on March 15, 2017).
10.20(C)#	Separation Agreement, effective as of May 19, 2017, by and between Vincent O'Neill, M.D. and Mirna Therapeutics, Inc. (incorporated by reference from the Current Report on Form 8-K filed with the Securities and Exchange Commission on May 25, 2017).
23.1	Consent of Ernst & Young LLP, Independent Registered Public Accounting Firm to Mirna Therapeutics, Inc.
23.2	Consent of KPMG LLP, Independent Registered Public Accounting Firm to Synlogic, Inc.
23.3*	Consent of Latham & Watkins LLP (included in Exhibit 5.1 hereto).
24.1	Power of attorney (included on the signature page to this Registration Statement).
99.1*	Form of Proxy Card for the Mirna Therapeutics, Inc. Annual Meeting of Stockholders.
99.2	Opinion of Wedbush Securities Inc., financial advisor to Mirna Therapeutics, Inc. (included as *Annex B* to the proxy statement/prospectus/information statement forming a part of this Registration Statement).
99.3	Consent of Wedbush Securities Inc., financial advisor to Mirna Therapeutics, Inc.
99.4	Proposed Amended and Restated Certificate of Incorporation of Mirna Therapeutics, Inc. (included as *Annex D* to the proxy statement/prospectus/information statement forming a part of this Registration Statement).

Exhibit Number	Description of Document
99.5	Consent of Peter Barrett to be named as director.
99.6	Consent of Jose Carlos Gutierrez-Ramos Ph.D. to be named as director.
99.7	Consent of Chau Q. Khuong to be named as director.
99.8	Consent of Nick Leschly to be named as director.
101*	The following materials from the Registrant's Annual Report on Form 10-K for the year ended December 31, 2016 and the Registrant's Quarterly Report on Form 10-Q for the quarter ending March 31, 2017, formatted in Extensible Business Reporting Language (XBRL) includes*: (i) Balance Sheets at March 31, 2017 and December 31, 2016, (ii) Statements of Operations and Comprehensive Loss for the Three Months Ended March 31, 2017 and 2016, (iii) Statements of Cash Flows for the Three Months Ended March 31, 2017 and 2016 and (iv) Notes to Financial Statements.

* To be filed by amendment.
# Indicates a management contract or compensatory plan, contract or arrangement.
† Confidential treatment has been requested or granted as to certain portions, which portions have been omitted and filed separately with the Securities and Exchange Commission.

Exhibit 10.2(B)

LEASE TERMINATION AGREEMENT AND RELEASE

THIS LEASE TERMINATION AGREEMENT AND RELEASE (the "Agreement") is made this 5th day of May, 2017, by and between **G&I VII ENCINO TRACE II LP**, a Delaware limited partnership with an address of 555 East Lancaster Avenue, Suite 100, Radnor, Pennsylvania 19087 ("Landlord"), and **MIRNA THERAPEUTICS, INC.**, a Delaware corporation with an address of 5707 Southwest Parkway, Building II, Suite 100, Austin, Texas 78735 ("Tenant").

WITNESSETH THAT

WHEREAS, Landlord and Tenant entered into a certain lease dated June 24, 2016 (the "Lease") for the rental of certain property consisting of approximately 23,578 square feet of commercial space known as Suite 100 in the building located at 5707 Southwest Parkway, Building II, Austin, Texas 78735, as more particularly described in the Lease (the "Premises"); and

WHEREAS, Landlord and Tenant have agreed to terminate the Lease upon the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the foregoing and of the mutual promises hereinafter contained and other valuable consideration the receipt and sufficiency of which are hereby acknowledged, the parties hereto, intending to be legally bound, hereby agree as follows:

1. **Recitals**. The foregoing recitals are true and correct and incorporated herein by reference. All capitalized terms not defined in this Agreement shall have the meanings ascribed to them in the Lease.

2. **Lease Termination**. Provided the contingency identified in Section 4 below has occurred and the payment identified in Section 3 below has been received by Landlord, the Lease shall be deemed terminated effective 5:00 p.m. on the date on which Landlord and ARM execute a lease for the Premises (the "Termination Date"). Tenant hereby waives any right of redemption or other right to reclaim possession of the Premises. Tenant shall also surrender all keys to the Premises to Landlord on or before the Termination Date. Tenant shall continue to perform all of its obligations under the Lease through the Termination Date. Within five (5) business days after the Termination Date, Landlord will release the Letter of Credit to Tenant and refund the Security Deposit to Tenant.

3. **Settlement**. In consideration of Landlord's agreement to execute this Agreement, Tenant has agreed to pay and Landlord has agreed to accept the sum of Three Million Eight Hundred Seventeen Thousand Five Hundred Twenty-Eight Dollars ($3,817,528.00) (the "Settlement Amount"). The Settlement Amount must be received by Landlord within three (3) business days following full execution of this Agreement, via wire transfer, pursuant to the wire instructions below:

ACH Instructions:	**[###]**
Account #	**[###]**
ABA/Routing #	**[###]**

TENANT ACKNOWLEDGES AND AGREES THAT TIME IS OF THE ESSENCE WITH RESPECT TO THE PAYMENT DUE TO LANDLORD PURSUANT TO THIS SECTION 3.

4. **Contingency**. This Agreement is contingent upon Landlord's execution of a new lease for the Premises with ARM Holdings ("ARM"). Within three (3) business days after execution of a lease with ARM, Landlord will provide Tenant with written notice thereof. In the event Landlord does not execute a new lease for the Premises with ARM on or before May 30, 2017 (the "Contingency Date"), Landlord, at its sole option, may extend the Contingency Date for a period of up to sixty (60) days upon written notice to Tenant. If Landlord does not elect to extend the Contingency Date, this Agreement (including each of the releases set forth herein, but excluding the provisions of Section 12 below, which shall remain in full force and effect) shall be null and void, (i) within three (3) business days after the Contingency Date, Landlord shall reimburse Tenant for the full Settlement Amount via wire transfer, pursuant to the wire instructions below, and (ii) Landlord and Tenant shall remain fully obligated to perform all of their respective obligations under the Lease.

Beneficiary Name:	Mirna Therapeutics Inc.
Address:	2150 Woodward St, Suite 100 Austin, TX 78744
Routing Number:	**[###]**
Account Number:	**[###]**
Bank Name:	Comerica Bank
Address:	300 W. Sixth St, Suite 2250 Austin, TX 78701

LANDLORD ACKNOWLEDGES AND AGREES THAT TIME IS OF THE ESSENCE WITH RESPECT TO THE REIMBURSEMENT DUE TO TENANT PURSUANT TO THIS SECTION 4.

5. **Tenant Representations and Warranties; Lien Waiver**.

(a) Tenant hereby represents and warrants for purposes of this Agreement only that the following statements are true as of the date hereof:

(i) Tenant holds the entire interest of the "tenant" under the Lease.

(ii) Tenant has not pledged its interest in the Lease as collateral or otherwise sold, transferred, assigned or subleased all or any portion of the Lease or the Premises.

(iii) Tenant has no knowledge of any claim, injury or cause of action which has occurred, whether or not filed, by or for any party, relating to the Lease.

(iv) There are no contracts for the furnishing of any labor or materials remaining unpaid and an encumbrance on the Lease with respect to improvements or alterations in or about the Premises, including, without limitation, any sums due to Balfour Beatty Construction.

(v) No concessions or other rights of use and occupancy of the Premises have been granted by Tenant.

(b) Tenant agrees to defend, indemnify and save Landlord harmless from and against all loss or damage sustained by Landlord (and all expenses, costs and reasonable attorneys' fees of Landlord in any action or defense undertaken by Landlord to protect itself from such loss or damage) resulting only from any breach by Tenant of the representations and warranties made in Section 5(a) above.

(c) Tenant shall provide to Landlord, prior to the Termination Date (and as a condition to the release of Tenant hereunder), a final waiver and release (the "Balfour Waiver"), executed by an authorized officer of Balfour Beatty Construction ("Balfour"), wherein Balfour confirms that Tenant has paid all sums due to it by Tenant and has no claims against Landlord whatsoever.

6. **Broker Commissions**. Tenant shall provide to Landlord, prior to the Termination Date (and as a condition to the release of Tenant hereunder), a waiver and release (the "Broker Waiver"), executed by an authorized officer of Cox Oddo Commercial (aka Dan Cox Company) ("Tenant's Broker"), wherein Tenant's Broker releases Landlord of any and all obligations it may have to pay any additional sums to Tenant's Broker pursuant to the Lease or the written agreement between Landlord and Tenant's Broker. Further, Tenant shall indemnify and hold Landlord harmless from all liabilities arising from any compensation claimed by any broker or agent employed by Tenant or claiming to have been engaged by Tenant.

7. **Release**.

(a) Tenant, on its own behalf and on behalf of each of its shareholders, officers, subsidiaries, managers, board members, employees, partners, affiliates, agents and attorneys (collectively, "Tenant Parties") hereby release, disclaim and discharge Landlord and its officers, directors, members, partners, affiliates, subsidiaries, employees, agents and attorneys (collectively, "Landlord Parties") from, and covenant not to sue the Landlord Parties on account of, any and all claims that the Tenant Parties have, had or may have against the Landlord Parties including, without limitation, claims in any way relating to the Lease, the Premises, the Building, the Project or the negotiations leading to the execution of this Agreement from the beginning of the world to the date hereof, provided, however, nothing in this Section 7(a) shall be deemed to release Landlord from its obligations under this Agreement.

(b) Upon Landlord's receipt of a signed copy of this Agreement and payment of the Settlement Amount, Landlord shall be deemed to have released, disclaimed and discharged Tenant from, and covenanted not to sue the Tenant on account of, any and all claims that the Landlord has, had or may have against the Tenant in any way relating to the Lease, the Premises, the Building, the Project or the negotiations leading to the execution of this Agreement from the beginning of the world to the date hereof, provided, however, nothing in this Section 7(b) shall release Tenant from its obligations under this Agreement or from third party and environmental indemnity obligations which survive termination of the Lease. Further, the release provided herein is expressly contingent upon each of the following conditions: (i) Tenant shall not have filed or suffered a bankruptcy or similar petition under the United States Bankruptcy Code (the "Code") or similar state code or have made an assignment for the benefit of creditors or requested or be subject to the appointment of a receiver for ninety-one days post Landlord's receipt of the Settlement Amount and (ii) neither this Agreement, nor any payment or transfer contemplated hereby, shall be claimed to be or deemed by a court as a "fraudulent conveyance" or "preference" as those terms are commonly understood under the Code or any like state statute. In furtherance of the foregoing, and not in limitation thereof, if any of the conditions set forth in the immediately preceding sentence are not satisfied, Landlord shall be entitled to enforce all rights and or remedies under the Lease and shall not be bound by the conditional agreement to release set forth herein.

8. **No Credit**. Tenant acknowledges that it shall receive no credit against the Settlement Amount in the event Landlord re-lets the Premises and collects rent from any successor tenant.

9. **Further Assurances**. Landlord and Tenant shall execute such other and further agreements or instruments necessary or appropriate in order to carry out the terms of this Agreement.

10. **Confidentiality**. Landlord and Tenant agree to treat the terms and existence of this Agreement as confidential, and shall not disclose this Agreement, or the terms thereof, to any third party (other than outside counsel, auditors or insurers for Tenant or as may be required by law) absent a court order, the written consent of the non-disclosing party, or as may be required under applicable law (including disclosures required by applicable securities laws).

11. **Miscellaneous.**

(a) This Agreement and the provisions contained herein shall be governed and construed in accordance with the laws of the State of Texas.

(b) The party executing this Agreement on behalf of Landlord and Tenant warrant that he/she he is duly authorized to so act.

(c) This Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective successors and assigns.

(d) Unless the context otherwise specifies or requires, all the terms used in this Agreement shall have the meaning specified in the Lease, such definitions to be applicable equally to the singular and plural forms of such terms and to all genders.

(e) This Agreement may be executed in multiple counterparts and each such counterpart shall be an original and all counterparts, together, shall be a single document. The parties agree to accept and rely on facsimile or “pdf” copies of signatures on this Agreement as originals.

(f) Landlord and Tenant shall execute such other and further agreements or instruments necessary or appropriate in order to carry out this Agreement.

12. **Amendments to Lease**. Notwithstanding any termination of this Agreement due to Landlord’s failure to execute a lease with ARM before the Contingency Date, as it may be extended, Landlord agrees as follows:

(a) Tenant's failure to occupy the Premises does not constitute a default (nor, upon notice from Landlord, an Event of Default) under the Lease. As of the date of this Agreement, Tenant is not in default under the Lease and the Lease is in full force and effect.

(b) Landlord agrees that the date on which any undisbursed portion of the Improvement Allowance is waived, is extended from the 18-month anniversary of the date on which the Lease is fully executed and delivered to the 24-month anniversary of the date on which the Lease was fully executed and delivered.

Signature page to follow

IN WITNESS WHEREOF, Landlord and Tenant have signed and dated this Lease Termination Agreement and Release as of the day and year first above written.

LANDLORD:

G&I VII ENCINO TRACE II LP

By: G&I VII Encino Trace GP LLC, its general partner

By: G&I VII Austin Office LLC, its sole member

By: BDN Austin Properties LLC, its operating manager

By: /s/ William D. Redd
Name: William D. Redd
Title: Executive Vice President and Senior Managing Director

TENANT:

MIRNA THERAPEUTICS, INC.

By: /s/ Alan Fuhrman
Name: Alan Fuhrman
Title: Chief Financial Officer

Grant ID: RP101219
Attachment F - Contract Amendment

CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

As indicated by the signatures below, the INSTITUTE and the RECIPIENT agree to the following amendments to the CPRIT Contract:

Contract Document F: This Attachment (this "Attachment"), dated as of May 11, 2017, is hereby incorporated into and made a part of that certain CANCER RESEARCH GRANT CONTRACT ("Contract") effective as of August 1, 2010 by and between the Cancer Prevention and Research Institute of Texas ("CPRIT" or the "INSTITUTE") and Mirna Therapeutics, Inc. (the "RECIPIENT"). A capitalized term used in this Attachment shall have the meaning given the term in the Contract or in the Attachments to the Contract, unless otherwise defined herein. In the event of a conflict between the provisions of this Attachment and the provisions of the Contract, this Attachment shall control. 1. Consistent with Texas Administrative Code, Title 25, Part 11, 703.13, and because no Grant funds were expended during the RECIPIENT's fiscal year in which the Contract was terminated, Section 4.01 is hereby restated and amended in its entirety as follows: Section 4.01 Record Keeping. The RECIPIENT, each Collaborator and each Contractor whose costs are funded in all or in part by the Grant shall maintain or cause to be maintained books, records, documents and other evidence (electronic or otherwise) pertaining in any way to its performance under and compliance with the terms and conditions of this Contract ("Records"). The RECIPIENT, each Collaborator and each Contractor shall use, or shall cause the entity which is maintaining such Records to use generally accepted accounting principles in the maintenance of such Records, and shall retain or require to be retained all of such Records for a period of three (3) years from the Termination Date of the Contract. 2. Consistent with Texas Administrative Code, Title 25, Part 11, 703.13, and because no Grant funds were expended during the RECIPIENT's fiscal year in which the Contract was terminated, Section 4.02 is hereby restated and amended in its entirety as follows: Section 4.02 Audits. Upon request and with reasonable notice, the RECIPIENT, each Collaborator and each Contractor whose costs are charged to the Project shall allow, or shall cause the entity which is maintaining such items to allow, the INSTITUTE, or auditors working on behalf of the INSTITUTE, including the State Auditor and/or the Comptroller of Public Accounts for the State of Texas, to review, inspect, audit, copy or abstract all of its Records during regular working hours. Acceptance of funds directly under the Contract or indirectly through a subcontract under the Contract constitutes acceptance of the authority of the INSTITUTE, or auditors working on behalf of the INSTITUTE, including the State Auditor and/or the Comptroller of Public Accounts, to conduct an audit or investigation in connection with those funds for a period of three (3) years from the Termination Date of the Contract. Notwithstanding the foregoing, any RECIPIENT expending $500,000 or more in federal or state awards during its fiscal year shall obtain either an annual single audit or a program specific audit. A RECIPIENT expending funds from only one federal program (as listed in the Catalog of Federal Domestic Assistance (CFDA)) or one state program may elect to obtain a program specific audit in accordance with Office of Management and Budget (OMB) Circular A-133 or with the State of Texas Uniform Grant Management Standards (UGMS). A single audit is required if funds from more than one federal or state program are spent by the RECIPIENT. The audited time period is the RECIPIENT's fiscal year, not the INSTITUTE funding period. 3. Section 4.07 is revised by adding the following paragraph to the end of Section 4.07: "Following good faith negotiations, INSTITUTE and RECIPIENT agree that in light of special circumstances, RECIPIENT shall repay the INSTITUTE $5,000,000.00 of Grant proceeds (the "Payment") within 5 business days following the date of this Attachment and INSTITUTE and RECIPIENT agree to the immediate and automatic termination of Section 4.07 immediately upon the Payment by RECIPIENT. INSTITUTE and RECIPIENT agree that as of the date of this Attachment, RECIPIENT has fulfilled all obligations to INSTITUTE under Section 4.07 as

of such date and has no liability, obligations, or any other commitments to INSTITUTE under Section 4.07." 4. INSTITUTE and RECIPIENT agree to incorporate herein by reference the letter dated May 11, 2017 Re: Agreement and Resolution of Negotiations regarding Cancer Research Grant Contracts by and between the Cancer Prevention and Research Institute of Texas and Mirna Therapeutics, Inc., as uploaded into CGMS Ad Hoc Documents May 11, 2017 to this Attachment F-4.

Description: To amend Section 4.01 Record Keeping, Section 4.02 Audits and Section 4.07 of the Contract. Incorporate by reference the letter dated May 11, 2017 Re: Agreement and Resolution of Negotiations regarding Cancer Research Grant Contracts by and between the Cancer Prevention and Research Institute of Texas and Mirna Therapeutics, Inc., as uploaded into CGMS Ad Hoc Documents May 11, 2017 to this Attachment F-4.

RECIPIENT
Mirna Therapeutics, Inc.
ASO Name: DeYoung, Casi
Submitted Date: 11 May 2017

INSTITUTE
Cancer Prevention & Research Institute of Texas
CEO Name: Roberts, Wayne
Approved Date: 11 May 2017

Grant ID: DP140067
Attachment F - Contract Amendment

CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

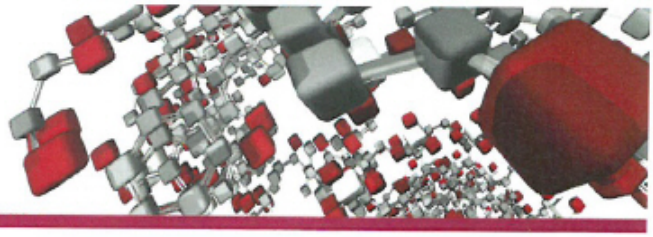
As indicated by the signatures below, the INSTITUTE and the RECIPIENT agree to the following amendments to the CPRIT Contract:

Contract Document F: This Attachment (this "Attachment"), dated as of May 11, 2017, is hereby incorporated into and made a part of that certain CANCER RESEARCH GRANT CONTRACT ("Contract") effective as of June 1, 2014 by and between the Cancer Prevention and Research Institute of Texas ("CPRIT" or the "INSTITUTE") and Mirna Therapeutics, Inc. (the "RECIPIENT"). A capitalized term used in this Attachment shall have the meaning given the term in the Contract or in the Attachments to the Contract, unless otherwise defined herein. In the event of a conflict between the provisions of this Attachment and the provisions of the Contract, this Attachment shall control. 1. Mirna hereby provides notice of its intent to terminate that certain Cancer Research Grant Contract by and between CPRIT and Mirna effective as of June 1, 2014 (including any attachments thereto, the ("2014 Contract") pursuant to Section 8.04 thereof. The termination of the 2014 Contract will be made prior to the Termination Date of the 2014 Contract pursuant to Section 8.01(d) of the 2014 Contract, which permits Mirna to terminate the 2014 Contract for convenience. The Parties agree that CPRIT waives the 30-day notice required under Section 8.04 and that the Termination of the 2014 Contract will be effective upon CPRIT's receipt of this notice, on May 11, 2017. 2. INSTITUTE and RECIPIENT agree to incorporate herein by reference the letter dated May 11, 2017 Re: Agreement and Resolution of Negotiations regarding Cancer Research Grant Contracts by and between the Cancer Prevention and Research Institute of Texas and Mirna Therapeutics, Inc. as uploaded into CGMS Ad Hoc Documents, to this Attachment.

Description: Terminate the contract effective May 11, 2017. Incorporate herein by reference the letter dated May 11, 2017 Re: Agreement and Resolution of Negotiations regarding Cancer Research Grant Contracts by and between the Cancer Prevention and Research Institute of Texas and Mirna Therapeutics, Inc. as uploaded into CGMS Ad Hoc Documents, to this Attachment.

RECIPIENT
Mirna Therapeutics, Inc.
ASO Name: DeYoung, Casi
Submitted Date: 11 May 2017

INSTITUTE
Cancer Prevention & Research Institute of Texas
CEO Name: Roberts, Wayne
Approved Date: 11 May 2017



Paul Lammers, M.D., M.Sc.
President and Chief Executive Officer
Mirna Therapeutics, Inc.
1250 South Capital of Texas Highway
Building 3, Suite 400
Austin, TX 78746

May 11, 2017

Wayne Roberts
Chief Executive Officer
Cancer Prevention and Research Institute of Texas
P.O. Box 12097
Austin, TX 78711

Re: Agreement and Resolution of Negotiations regarding Cancer Research Grant Contracts by and between the Cancer Prevention and Research Institute of Texas and Mirna Therapeutics, Inc.

Mr. Roberts,

I write on behalf of Mirna Therapeutics, Inc. ("Mirna" or the "Company") in reference to (i) that certain Cancer Research Grant Contract effective as of August 1, 2010 (including any attachments thereto, the "2010 Contract"), by and between the Cancer Prevention and Research Institute of Texas ("CPRIT") and Mirna, and (ii) that certain Cancer Research Grant Contract by and between CPRIT and Mirna effective as of June 1, 2014 (including any attachments thereto, the "2014 Contract"). This letter is intended to resolve and memorialize the negotiations between CPRIT and Mirna relating to the 2010 Contract and 2014 Contract.

By way of background, as you know, Mirna is a biopharmaceutical company that has historically focused on microRNA-based oncology therapeutics. The Company's first product candidate, MRX34, was studied as a single agent in a Phase 1 clinical trial that was voluntarily halted in September 2016 following multiple immune-related serious adverse events observed in patients dosed with MRX34 in the trial. In November 2016, the Company discontinued research and development activities to reduce operating expenses while the Company evaluated its strategic alternatives. Mirna also initiated a plan in November 2016 to reduce personnel consistent with the decision to discontinue development of MRX34 and the Company's microRNA product pipeline. Mirna's corporate strategy currently is focused on pursuing strategic initiatives to enhance stockholder value, including but not limited to a merger or the sale of the Company. The Company has engaged a financial and strategic advisor to explore alternatives to accomplish this goal. That strategic process is both active and ongoing and includes a range of interactions with transaction counterparties.

Mirna has made CPRIT aware that as a result of the ongoing strategic process, the Company may enter into a strategic transaction with an entity not based in Texas and has engaged in negotiations with CPRIT relating to Mirna's obligations and liability to CPRIT under the 2010 Contract and the 2014 Contract. As part of those negotiations, CPRIT and Mirna (together, the "Parties") have agreed to enter into an amendment to the 2010 Contract ("Attachment F-4"), which requires Mirna to repay $5,000,000.00 of the Grant[1] proceeds (the "Payment") to CPRIT within 5 business days following the date of Attachment F-4, and reflects the Parties' agreement that immediately upon the Payment by Mirna, Mirna has fulfilled all obligations to CPRIT under Section 4.07 of the 2010 Contract as of such date and has no liability, obligations, or any other commitments to CPRIT under Section 4.07 of the 2010 Contract.

In addition to the Parties' agreement as reflected in Attachment F-4, the Parties hereby further agree and CPRIT expressly acknowledges through its signature below that:

With respect to the 2010 Contract:

1. As a result of the ongoing strategic process, Mirna intends to enter into a definitive agreement pursuant to which Mirna will consummate a change of control transaction and CPRIT hereby provides consent to any assignment of the 2010 Contract pursuant to Section 2.09 thereof that may occur as a result of any such change of control transaction.
2. CPRIT has not identified any unresolved deficiencies in any audits or inspections of Mirna, or concluded that Mirna improperly used any of the Grant funds awarded under the 2010 Contract, and as such, Mirna has fulfilled all obligations under Sections 4.05 and 4.06 of the 2010 Contract and has no ongoing obligations or liability to CPRIT pursuant to those Sections.
3. CPRIT has not identified any event of default under Section 8.03 of the 2010 Contract, and as such, Mirna has fulfilled all obligations under that Section and has no ongoing obligations or liability to CPRIT pursuant to that Section or Section 8.05 of the 2010 Contract.
4. No Early Termination of the 2010 Contract occurred, and as such, Mirna has fulfilled all obligations under Section 8.06 of the 2010 Contract and has no ongoing obligations or liability to CPRIT pursuant to that Section.
5. Pursuant to Section D1.05 of the 2010 Contract, and included in the Company's annual reports, no Institute-Funded Inventions were recorded during the Contract Term. The Parties hereby agree that there are no existing Institute-Funded IPR associated with this 2010 Contract.

1 A capitalized term used in this letter shall have the meaning given the term in the applicable 2010 Contract or 2014 Contract, unless otherwise defined herein.

6. Mirna hereby makes an election under Section D3.06 of the 2010 Contract to cease its efforts to commercialize or otherwise bring to practical application the Project Results. The Project Results have been provided to CPRIT in the form of annual progress reports throughout the Contract Term as well as a final progress report submitted on April 24, 2014 and approved by CPRIT on June 18, 2014. Mirna's rationale for this election is based on decision to discontinue all research and development activities for its microRNA pipeline, including the development of MRX34. Mirna has discussed these results with CPRIT and has also publicly disclosed a summary of these results in its filings with the U.S. Securities and Exchange Commission. CPRIT acknowledges there are no further deadlines in relation to the applicable Project Results. Accordingly, CPRIT shall have an option pursuant to Section D5.01 of the 2010 Contract to commercialize or otherwise bring to practical application the applicable Project Results, at CPRIT's cost, either directly or through one or more licensees, by exercising such option by written notice to Mirna within 30 days of the date of this letter.

7. The Parties agree that as a result of Mirna's above election under Section D3.06 to cease its efforts to commercialize the Project Results, all of Mirna's obligations to CPRIT under Section 9.06 of the 2010 Contract have been fulfilled. Mirna has notified CPRIT and CPRIT acknowledges that the Company may enter into a strategic transaction with an entity not based in Texas and upon consummation of such transaction, Mirna will thereafter no longer be obligated to use reasonable efforts to conduct any further work in the State of Texas or be liable in any way to CPRIT for conducting further work outside the State of Texas.

With respect to the 2014 Contract:

1. Mirna has provided to CPRIT notice of its intent to terminate the 2014 Contract pursuant to Section 8.04 thereof. CPRIT agreed to waive the 30-day notice required under Section 8.04 and the Termination of the 2014 Contract will therefore be effective immediately. Upon Termination of the 2014 Contract, any funds remaining of the Investment Amount, which such funds the Parties acknowledge are not and will not be separately tracked from Mirna's other funds, will be included as assets in any change of control, sale of assets or other similar transaction and may be used without any conditions or liability attached, including any conditions to operate in or use services from Texas, or to track use of funds or to apply to any specific projects or activities.

2. Pursuant to Section 3.02 of the 2014 Contract, the Company has submitted the Form 269a Quarterly Financial Status Report including all cumulative Institute-Funded Activities and associated expenses. The Company also submitted the Final Product Development Progress Report on May 3, 2017 as well as other required final reports including Revenue Sharing, Historically Under Utilized Business, and Annual

Inventory forms and Matching Compliance Certification inclusive of the reporting period until the Termination Date. The Parties agree that the submission of expenses related to R&D activities associated with the clinical trial of MRX34 satisfy the matching requirement for this Contract under Section Cl .01 and CPRIT hereby agrees that all of the Company's obligations under Section Cl .01 of the Contract have been fulfilled and the Company has no ongoing obligations or liability to CPRIT pursuant to that Section.

3. CPRIT has not identified any unresolved deficiencies in any audits or inspections of Mirna, and as such, Mirna has fulfilled all obligations under Sections 4.05 of the 2014 Contract and has no ongoing obligations or liability to CPRIT pursuant to that Section.

4. For the avoidance of doubt, the Parties agree that Mirna's above election to cease its efforts to commercialize the Project Results also applies to the 2014 Contract and that all of Mirna's obligations to CPRIT under Sections 2.02, 9.06 and 9.07 of the 2014 Contract have been fulfilled.

5. The Parties acknowledge that the Termination of the 2014 Contract does not terminate any of CPRIT's rights as a shareholder of Mirna. The Parties also agree that, consistent with the provisions of the 2014 Contract that granted shares of Mirna Common Stock to CPRIT, no repayment obligations of any kind exist between CPRIT and Mirna under the 2014 Contract.

Please acknowledge your receipt of this letter and provide your acknowledgement and agreement to the foregoing by executing and returning a copy of this letter to Casi DeYoung via email at cdeyoung@mirnarx.com. Each Party hereby represents to the other Party that it has the legal authority to enter into and execute this letter and Attachment F-4, and it has taken all actions necessary to its execution, delivery and performance of this letter and Attachment F-4. By the Parties' signatures below and upon the Payment to CPRIT within 5 business days following the date of Attachment F-4, the Parties agree that this letter shall be incorporated into and made part of both the 2010 Contract and the 2014 Contract. In the event of a conflict between the provisions of this letter and the provisions of either the 2010 Contract or the 2014 Contract, this letter shall control.

Mirna appreciates CPRIT's consideration in these negotiations.

Very Truly Yours,

/s/ Paul Lammers, M.D., M.Sc.
Paul Lammers, M.D., M.Sc.

Acknowledged and Agreed:

/s/ Wayne R. Roberts
Wayne R. Roberts
CPRIT CEO
Date:

Exhibit 23.1

Consent of Independent Registered Public Accounting Firm

We consent to the reference to our firm under the caption “Experts” and to the use of our report dated March 14, 2017, included in the Proxy Statement of Mirna Therapeutics, Inc. that is made a part of the Registration Statement (Form S-4) and Prospectus of Mirna Therapeutics, Inc. for the registration of its common stock.

/s/ Ernst & Young LLP

Austin, Texas

June 21, 2017

Exhibit 23.2

Consent of Independent Registered Public Accounting Firm

The Board of Directors
Synlogic, Inc.:

We consent to the use of our report dated June 19, 2017, with respect to the consolidated balance sheets of Synlogic, LLC as of December 31, 2016 and 2015, and the related consolidated statements of operations and comprehensive loss, contingently redeemable preferred units and equity, and cash flows for the years then ended, included herein and to the reference to our firm under the heading “Experts” in the proxy statement/prospectus/information statement.

(signed) KPMG LLP

Cambridge, Massachusetts
June 19, 2017

Exhibit 99.3

Consent of Wedbush Securities Inc.

June 21, 2017

Board of Directors
Mirna Therapeutics, Inc.
PO Box 163387
Austin, TX 78716

Re: Registration Statement on Form S-4 of Mirna Therapeutics, Inc.

Members of the Board:

We hereby consent to: (i) the inclusion of our opinion letter, dated May 15, 2017, to the Board of Directors of Mirna Therapeutics, Inc. ("Mirna") as Annex B to the proxy statement/prospectus/information statement that forms part of the Registration Statement on Form S-4 of Mirna (the "Registration Statement") filed on June __, 2017; and (ii) the references made to our firm and such opinion in such Registration Statement under the captions "Prospectus Summary—Opinion of the Mirna Financial Advisor," "The Merger—Background of the Merger," "The Merger—Mirna Reasons for the Merger" and "The Merger—Opinion of the Mirna Financial Advisor." Notwithstanding the foregoing, in giving such consent, we do not admit and we hereby disclaim that we come within the category of persons whose consent is required under Section 7 of the Securities Act of 1933, as amended, or the rules and regulations of the Securities and Exchange Commission thereunder, nor do we hereby admit that we are experts with respect to any part of such Registration Statement within the meaning of the term "experts" as used in the Securities Act of 1933, as amended, or the rules and regulations of the Securities and Exchange Commission promulgated thereunder.

Very truly yours,

/s/ Wedbush Securities Inc.
WEDBUSH SECURITIES INC.

Exhibit 99.5

June 21, 2017

Mirna Therapeutics, Inc.
PO Box 163387
Austin, TX 78746

Consent to Reference in Proxy Statement/Prospectus/Information Statement

Mirna Therapeutics, Inc. (the "Company") is filing a Registration Statement on Form S-4 (Registration No. 333-) with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus/information statement included in such registration statement as a future member of the board of directors of the Company.

Sincerely,

/s/ Peter Barrett
Name: Peter Barrett, Ph.D.

Exhibit 99.6

June 21, 2017

Mirna Therapeutics, Inc.
PO Box 163387
Austin, TX 78746

Consent to Reference in Proxy Statement/Prospectus/Information Statement

Mirna Therapeutics, Inc. (the "Company") is filing a Registration Statement on Form S-4 (Registration No. 333-) with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus/information statement included in such registration statement as a future member of the board of directors of the Company.

Sincerely,

/s/ Jose Carlos Gutierrez-Ramos
Name: Jose Carlos Gutierrez-Ramos, Ph.D.

Exhibit 99.7

June 21, 2017

Mirna Therapeutics, Inc.
PO Box 163387
Austin, TX 78746

Consent to Reference in Proxy Statement/Prospectus/Information Statement

Mirna Therapeutics, Inc. (the "Company") is filing a Registration Statement on Form S-4 (Registration No. 333-) with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus/information statement included in such registration statement as a future member of the board of directors of the Company.

Sincerely,

/s/ Chau Q. Khuong
Name: Chau Q. Khuong

Exhibit 99.8

June 21, 2017

Mirna Therapeutics, Inc.
PO Box 163387
Austin, TX 78746

Consent to Reference in Proxy Statement/Prospectus/Information Statement

Mirna Therapeutics, Inc. (the "Company") is filing a Registration Statement on Form S-4 (Registration No. 333-) with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"). In connection therewith, I hereby consent, pursuant to Rule 438 of the Securities Act, to the reference to me in the proxy statement/prospectus/information statement included in such registration statement as a future member of the board of directors of the Company.

Sincerely,

/s/ Nick Leschly
Name: Nick Leschly