

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

FORM S-8

**REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933**

Mirna Therapeutics, Inc.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

26-1824804
(I.R.S. Employer
Identification Number)

**2150 Woodward Street, Suite 100
Austin, TX 78744
(512) 901-0900**

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

**2015 Equity Incentive Award Plan
2015 Employee Stock Purchase Plan
(Full Title of the Plan)**

**Paul Lammers, M.D., M.Sc.
President & Chief Executive Officer
Mirna Therapeutics, Inc.
2150 Woodward Street, Suite 100
Austin, TX 78744
(512) 901-0900**

(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

**Alan C. Mendelson, Esq.
Mark V. Roeder, Esq.
Latham & Watkins LLP
140 Scott Drive
Menlo Park, CA 94025
Telephone: (650) 328-4600
Facsimile: (650) 463-2600**

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" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	<input type="radio"/>		Accelerated filer	<input type="radio"/>
Non-accelerated filer	<input checked="" type="radio"/>	(Do not check if a smaller reporting company)	Smaller reporting company	<input type="radio"/>

CALCULATION OF REGISTRATION FEE

Title of Securities to be Registered	Amount to be Registered(1)	Proposed Maximum Offering Price Per Share(2)	Proposed Maximum Aggregate Offering Price(2)	Amount of Registration Fee
Common Stock, par value \$0.001 per share	1,249,832 shares	\$ 4.63	\$ 5,786,722.16	\$ 582.73

(1) Pursuant to Rule 416(a) under the Securities Act of 1933, as amended (the "Securities Act"), this registration statement shall also cover any additional shares of the Registrant's common stock that become issuable under the 2015 Equity Incentive Award Plan (the "2015 Plan") and the 2015 Employee Stock Purchase Plan (the "ESPP") by reason of any stock dividend, stock split, recapitalization or similar transaction effected without the Registrant's receipt of consideration which would increase the number of outstanding shares of common stock.

(2) Estimated solely for the purpose of calculating the amount of the registration fee pursuant to Rule 457(c) and Rule 457(h) promulgated under the Securities Act. The offering price per share and the aggregate offering price for shares reserved for future issuance under the 2015 Plan and ESPP are based on the average of the high and the low price of Registrant's common stock as reported on NASDAQ on March 24, 2016. The chart below details the calculations of the registration fee:

Securities	Number of Shares	Offering Price Per Share	Aggregate Offering Price
Shares reserved for future grant under the 2015 Plan	1,041,527(3)	\$ 4.63(2)	\$ 4,822,270.01
Shares reserved for future grant under the ESPP	208,305(4)	\$ 4.63(2)	\$ 964,452.15
Proposed Maximum Aggregate Offering Price			\$ 5,786,722.16

(3) Represents the additional shares of common stock available for future issuance under the 2015 Plan resulting from an annual increase as of January 1, 2016.

(4) Represents the additional shares of common stock available for future issuance under the ESPP resulting from an annual increase as of January 1, 2016.

**Proposed sale to take place as soon after the effective date of the
registration statement as awards under the plans are exercised and/or vest.**

EXPLANATORY NOTE

Exhibit Index

Exhibit Number	Exhibit Description	Incorporated by Reference			Filed Herewith
		Form	Date	Number	
4.1	Amended and Restated Certificate of Incorporation.	8-K	10/6/2015	3.1	
4.2	Amended and Restated Bylaws.	8-K	10/6/2015	3.2	
4.3	Form of Common Stock Certificate.	S-1/A	09/18/2015	4.2	
4.4	Third Amended and Restated Investor Rights Agreement, dated as of March 31, 2015, by and among Mirna Therapeutics, Inc. and certain of its stockholders.	S-1/A	09/11/2015	4.3	
4.5	Registration Rights Agreement, dated October 5, 2015, by and between Mirna Therapeutics, Inc. and the Cancer Prevention and Research Institute of Texas.	8-K	10/6/2015	4.1	
5.1	Opinion of Latham & Watkins LLP.				X
23.1	Consent of independent registered public accounting firm.				X
23.2	Consent of Latham & Watkins LLP (included in Exhibit 5.1).				X
24.1	Power of Attorney. Reference is made to the signature page to the Registration Statement.				X
99.1(A)#	2008 Long Term Incentive Plan, as amended.	S-1	8/24/2015	10.8(A)	
99.1(B)#	Form of Notice of Stock Option Grant under 2008 Long Term Incentive Plan.	S-1	8/24/2015	10.8(B)	
99.1(C)#	Form of Stock Option Agreement under 2008 Long Term Incentive Plan.	S-1	8/24/2015	10.8(C)	
99.2(A)#	2015 Equity Incentive Award Plan.	S-1	9/18/2015	10.9(A)	
99.2(B)#	Form of Stock Option Grant Notice and Stock Option Agreement under the 2015 Equity Incentive Award Plan.	S-1/A	9/11/2015	10.9(B)	
99.2(C)#	Form of Restricted Stock Award Agreement and Restricted Stock Unit Award Grant Notice under the 2015 Equity Incentive Award Plan.	S-1/A	9/11/2015	10.9(C)	
99.3#	2015 Employee Stock Purchase Plan.	S-1/A	9/18/2015	10.10	

#Indicates management contract or compensatory plan.

FIRM / AFFILIATE OFFICES

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Houston	Silicon Valley
London	Singapore
Los Angeles	Tokyo
Madrid	Washington, D.C.

March 29, 2016

Mirna Therapeutics, Inc.
2150 Woodward Street, Suite 100
Austin, TX 78744

Re: Registration Statement on Form S-8; 1,249,834 shares of Common Stock of Mirna Therapeutics, Inc., par value \$0.001 per share

Ladies and Gentlemen:

We have acted as special counsel to Mirna Therapeutics, Inc., a Delaware corporation (the "**Company**"), in connection with the registration by the Company of 1,249,834 shares of common stock of the Company, par value \$0.001 per share (the "**Shares**"), issuable under the 2015 Equity Incentive Award Plan (the "**2015 Plan**") and 2015 Employee Stock Purchase Plan (the "**ESPP**" and together with the 2015 Plan, the "**Plans**").

The Shares are included in a registration statement on Form S—8 under the Securities Act of 1933, as amended (the "**Act**"), filed with the Securities and Exchange Commission (the "**Commission**") on March 29, 2016 (the "**Registration Statement**"). This opinion is being furnished in connection with the requirements of Item 601(b)(5) of Regulation S-K under the Act, and no opinion is expressed herein as to any matter pertaining to the contents of the Registration Statement or the related prospectuses, other than as expressly stated herein with respect to the issue of the Shares.

As such counsel, we have examined such matters of fact and questions of law as we have considered appropriate for purposes of this letter. With your consent, we have relied upon certificates and other assurances of officers of the Company and others as to factual matters without having independently verified such factual matters. We are opining herein as to the General Corporation Law of the State of Delaware (the "**DGCL**"), and we express no opinion with respect to any other laws.

March 29, 2016
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LATHAM & WATKINS^{LLP}

Subject to the foregoing and the other matters set forth herein, it is our opinion that, as of the date hereof, when the Shares shall have been duly registered on the books of the transfer agent and registrar therefor in the name or on behalf of the purchasers and have been issued by the Company against payment therefor (not less than par value) in the circumstances contemplated by the Plans, assuming in each case that the individual issuances, grants or awards under the Plans are duly authorized by all necessary corporate action and duly issued, granted or awarded and exercised in accordance with the requirements of law and the Plans (and the agreements and awards duly adopted thereunder and in accordance therewith), the issue and sale of the Shares will have been duly authorized by all necessary corporate action of the Company, and the Shares will be validly issued, fully paid and nonassessable. In rendering the foregoing opinion, we have assumed that the Company will comply with all applicable notice requirements regarding uncertificated shares provided in the DGCL.

This opinion is for your benefit in connection with the Registration Statement and may be relied upon by you and by persons entitled to rely upon it pursuant to the applicable provisions of the Act. We consent to your filing this opinion as an exhibit to the Registration Statement. In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the Commission thereunder.

Very truly yours,

/s/ Latham & Watkins LLP

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the Registration Statement (Form S-8) pertaining to the 2015 Equity Incentive Award Plan and 2015 Employee Stock Purchase Plan of Mirna Therapeutics, Inc. of our report dated March 29, 2016 with respect to the financial statements of Mirna Therapeutics, Inc. included in its Annual Report (Form 10-K) for the year ended December 31, 2015, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Austin, Texas
March 29, 2016
