

August 23, 2018

VIA EDGAR

U.S. Securities and Exchange Commission
Division of Corporation Finance
100 F Street, N.E. Washington, D.C. 20549
Attention: Irene Paik

Re: Synlogic, Inc.
Registration Statement on Form S-3
Filed August 9, 2018
File No. 333-226730 (the “Registration Statement”)

Dear Ms. Paik:

We are submitting this letter on behalf of Synlogic, Inc. (the “Company”) in response to comments from the staff (the “Staff”) of the Securities and Exchange Commission (the “Commission”) received by letter dated August 17, 2018 (the “Comment Letter”) from the Division of Corporation Finance, Office of Healthcare and Insurance, to Aoife M. Brennan, Interim President and Chief Executive Officer of the Company, relating to the above-referenced Registration Statement. In conjunction with this letter, the Company is filing Amendment No. 1 to the Registration Statement (the “Amended Registration Statement”) with the Commission.

For convenient reference, we have set forth below in italics each of the Staff’s comments set forth in the Comment Letter and have keyed the Company’s responses to the numbering of the comments and the headings used in the Comment Letter. All of the responses are based on information provided to Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C. by representatives of the Company. Where appropriate, the Company has responded to the Staff’s comments by making changes to the disclosure in the Amended Registration Statement. Page numbers referred to in the responses reference the applicable pages of the Amended Registration Statement.

Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.

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Description of Purchase Contracts, page 22

Comment 1: We note your disclosure that you may issue purchase contracts for the purchase or sale of securities that may consist of securities of third parties. Please advise us how you anticipate conducting such offerings under the registration and disclosure requirements of the Securities Act. For example, please advise us of the disclosure you will provide in the applicable prospectus supplement or other offering materials, including, as necessary, any required financial statement and non-financial statement disclosure about the issuer of such securities. For guidance, please refer to the Morgan Stanley & Co., Inc. no action letter (June 24, 1996) and Securities Act Sections Compliance and Disclosure Interpretation 203.03.

Response 1: The Company acknowledges the Staff's comment and confirms that it does not wish to offer any third party securities underlying purchase contracts. The Company has revised the Registration Statement to remove references to such third party securities. Please see the revised disclosure on page 22 of the Amended Registration Statement.

Comment 2: It is not clear how the purchase contracts you propose to issue should be characterized for purposes of the federal securities laws. For example, the disclosure in the filing indicates that these contracts obligate you to purchase from holders, and obligate holders to sell to you, securities at a purchase price that may be fixed or may be determined by a specific formula. The disclosure in the filing also indicates that these contracts may require you to make periodic payments to the holders or for holders to make periodic payments to you. Furthermore, the disclosure indicates that you may purchase contracts separately or as part of units each consisting of a purchase contract and one or more securities, including U.S. Treasury securities. Finally, the disclosure in the filing indicates that these contracts may require the holders of the contracts to secure their obligations in a specified manner. Based on this disclosure it appears that these contracts may have characteristics associated with forwards, options and security-based swaps. Please provide us with your legal analysis as to how these contracts should be appropriately characterized under the federal securities laws.

Response 2: In response to the Staff's comment, the Company has revised the Registration Statement to seek to register purchase contracts with respect to the future delivery of equity securities of the Company under the Registration Statement. As a result, the Company respectfully submits that the purchase contracts are properly characterized as "investment contracts" as that term is used in Section 2(a)(1) of the Securities Act.

The Company has also revised the Registration Statement to, among other things, clarify that any purchase contracts the Company issues will be physically settled by delivery of the equity securities. Accordingly, such purchase contracts should be properly excluded from the definition of "swap" under Section 1a(47)(B) of the Commodity Exchange Act and from the definition of "security-based swap" under Section 2(a)(17) of the Securities Act, Section 1a(42) of the Commodity Exchange Act and Section 3(a)(68) of the Securities Exchange Act of 1934, as amended. Please see the revised disclosure on page 22 of the Amended Registration Statement.

Comment 3: We note the reference to “other property” that may be included in the purchase contracts. Please revise your disclosure to specify what other property may be included in the purchase contracts.

Response 3: In response to the Staff’s comment, the Company has removed from the Registration Statement references to “other property” that may be included in the purchase contracts. Please see the revised disclosure on page 22 of the Amended Registration Statement.

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We hope that the above responses and the related revisions reflected in the Amended Registration Statement will be acceptable to the Staff. Please do not hesitate to contact me at (617) 348-1735 or MJGardella@mintz.com with any comments or questions regarding the Amended Registration Statement and this letter. We thank you for your time and attention.

Sincerely,

/s/ Matthew J. Gardella
Matthew J. Gardella

cc: Securities and Exchange Commission
Mary Beth Breslin

Synlogic, Inc.

Aoife M. Brennan, Interim President and Chief Executive Officer

Todd Shegog, Chief Financial Officer

Maiken Keson-Brookes, General Counsel