

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

FORM S-8

REGISTRATION STATEMENT UNDER
THE SECURITIES ACT OF 1933

Assembly Biosciences, Inc.

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of
incorporation or organization)

20-8729264

(I.R.S. Employer
Identification No.)

**331 Oyster Point Blvd., Fourth Floor
South San Francisco, California**
(Address of Principal Executive Offices)

94080

(Zip Code)

**Assembly Biosciences, Inc. 2018 Stock Incentive Plan
Assembly Biosciences, Inc. 2020 Inducement Award Plan**
(Full title of the plan)

**Jason A. Okazaki
Chief Legal and Business Officer
Assembly Biosciences, Inc.
331 Oyster Point Blvd., Fourth Floor
South San Francisco, California 94080**
(Name and address of agent for service)

(833) 509-4583

(Telephone number, including area code, of agent for service)

Copies to:

**P. Michelle Gasaway, Esq.
Skadden, Arps, Slate, Meagher & Flom LLP
300 South Grant Avenue, Suite 3400
Los Angeles, California 90071
(213) 687-5000**

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company or an emerging growth 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.

Large accelerated filer
Non-accelerated filer

Accelerated filer
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 7(a)(2)(B) of the Securities Act.

CALCULATION OF REGISTRATION FEE

Title of securities to be registered	Amount to be registered(1)	Proposed maximum offering price per share	Proposed maximum aggregate offering price	Amount of registration fee
Common Stock, \$0.001 par value per share(2)	1,600,000	\$21.02	\$33,632,000(4)	\$4,365.43
Common Stock, \$0.001 par value per share(3)	800,000	\$21.02	\$16,816,000(4)	\$2,182.72
Total	2,400,000		\$50,448,000	\$6,548.15

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- (1) Pursuant to Rule 416 under the Securities Act of 1933, as amended (the Securities Act), this registration statement (the Registration Statement) shall also cover an indeterminate number of shares that may become issuable under (a) the Assembly Biosciences, Inc. 2018 Stock Incentive Plan or (b) the Assembly Biosciences, Inc. 2020 Inducement Award Plan, in each case by reason of any stock dividend, stock split or similar transaction effected without the receipt of consideration that results in an increase in the number of the outstanding shares of common stock.
- (2) Represents shares of common stock issuable under the Assembly Biosciences, Inc. 2018 Stock Incentive Plan.
- (3) Represents shares of common stock issuable under the Assembly Biosciences, Inc. 2020 Inducement Award Plan.
- (4) Estimated solely for the purpose of calculating the registration fee in accordance with Rule 457(h) of the Securities Act. The proposed maximum aggregate offering price is calculated pursuant to Rule 457(c) and Rule 457(h) under the Securities Act based on the average of the high and low sale prices of the Registrant's common stock as reported by The Nasdaq Global Select Market on August 25, 2020.
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PART I

INFORMATION REQUIRED IN THE SECTION 10(a) PROSPECTUS

Item 1. Plan Information.

The documents containing the information specified in Part I will be delivered in accordance with Form S-8 and Rule 428(b) under the Securities Act of 1933, as amended (the Securities Act). Such documents are not required to be, and are not, filed with the Securities and Exchange Commission (the Commission), either as part of this Registration Statement or as prospectuses or prospectus supplements pursuant to Rule 424 under the Securities Act. These documents, and the documents incorporated by reference in this Registration Statement pursuant to Item 3 of Part II of this Form S-8, taken together, constitute a prospectus that meets the requirements of Section 10(a) of the Securities Act.

Item 2. Registrant Information and Employee Plan Annual Information.

The written statement required by Item 2 of Part I is included in documents delivered to participants in the plans covered by this Registration Statement pursuant to Rule 428(b) of the Securities Act.

PART II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 3. Incorporation of Documents by Reference.

The following documents, which have been filed with the Commission by Assembly Biosciences, Inc. (the Company or the Registrant), pursuant to the Securities Act and the Securities Exchange Act of 1934, as amended (the Exchange Act), as applicable, are hereby incorporated by reference in, and shall be deemed to be a part of, this Registration Statement:

- the Company's [Annual Report on Form 10-K for the year ended December 31, 2019](#), filed with the Commission on March 4, 2020 (including, for the avoidance of doubt, the information specifically incorporated by reference in the Company's Form 10-K from the Company's [Definitive Proxy Statement for the 2020 Annual Meeting of Stockholders](#), filed with the Commission on April 27, 2020);
- the Company's Quarterly Reports on Form 10-Q for the quarters ended [March 31, 2020](#) and [June 30, 2020](#), filed with the Commission on May 8, 2020 and August 5, 2020, respectively;
- our Current Reports on Form 8-K filed with the SEC on [January 3, 2020](#), [February 11, 2020](#), [June 16, 2020](#), [June 18, 2020](#), [July 20, 2020](#) and [August 27, 2020](#); and
- the description of the Company's common stock in the Company's Registration Statement on [Form 8-A](#) (File No. 001-35005) filed with the Commission on December 10, 2010, including any amendment or report filed by the Company for the purpose of updating such description, including [Exhibit 4.3 to the Company's Annual Report on Form 10-K for the year ended December 31, 2019](#), filed with the Commission on March 4, 2020.

All documents subsequently filed by the Company pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act prior to the filing of a post-effective amendment to this Registration Statement that indicates that all of the shares of common stock registered hereunder have been sold or that deregisters all of such shares then remaining unsold, shall be deemed to be incorporated by reference into this Registration Statement and to be a part hereof from the respective dates of filing of such documents, except as to any portion of any future annual or quarterly report to stockholders or document or current report furnished under current Item 2.02 or 7.01 or any related item 9.01 of Form 8-K that is not deemed filed under such provisions.

Any statement contained in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes of this Registration Statement to the extent that a statement contained herein, or in any other subsequently filed document that also is or is deemed to be incorporated by reference herein, modifies or supersedes such earlier statement. Any such statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this Registration Statement.

You may request a copy of these filings, at no cost, by writing or telephoning the Company at:

331 Oyster Point Blvd., Fourth Floor
South San Francisco, California 94080
Telephone: (833) 509-4583
Attn: Corporate Secretary

You should rely only on the information provided or incorporated by reference in this Registration Statement or any related prospectus. The Company has not authorized anyone to provide you with different information. You should not assume that the information in this Registration Statement or any related prospectus is accurate as of any date other than the date on the front of the document.

Item 4. Description of Securities.

Not applicable.

Item 5. Interests of Named Experts and Counsel.

None.

Item 6. Indemnification of Directors and Officers.

The Company is incorporated under the laws of the State of Delaware. Section 145 of the Delaware General Corporation Law (the DGCL) provides that a Delaware corporation may indemnify any persons who are, or are threatened to be made, parties 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 such corporation), by reason of the fact that such person was an officer, director, employee, or agent of such corporation, or is or was serving at the request of such person as an officer, director, employee, or agent of another corporation or enterprise. The indemnity may include expenses (including attorneys' fees), judgments, fines, and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit, or proceeding, provided that such person acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the corporation's best interests and, with respect to any criminal action or proceeding, had no reasonable cause to believe that his or her conduct was illegal.

Section 145 of the DGCL also gives a corporation the power 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 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) 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 and 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 that a present or former director or officer of a corporation has been successful on the merits or otherwise in defense of any such action, suit or proceeding, 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.

The Company's Amended and Restated Bylaws provide that:

- the Company shall indemnify its directors, officers and, in the discretion of its board of directors, certain employees and agents to the fullest extent permitted by the DGCL, as it now exists or may in the future be amended; and
- the Company shall advance reasonable expenses, including attorneys' fees, to its directors and officers in connection with legal proceedings relating to their service for or on behalf of the Company, subject to limited exceptions.

Section 145 of the DGCL also authorizes a 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 him and incurred by him in any such capacity, arising out of his status as such, whether or not the corporation would otherwise have the power to indemnify him under Section 145. The Company maintains general liability insurance which covers certain liabilities of its directors and officers arising out of claims based on acts or omissions in their capacities as directors or officers, including liabilities under the Securities Act.

The Company has adopted provisions in the Company's certificate of incorporation that limit or eliminate the personal liability of the Company's directors to the fullest extent permitted by the DGCL, as it now exists or may in the future be amended. Consequently, a director will not be personally liable to the Company or its stockholders for monetary damages for breach of fiduciary duty as a director, except for liability for:

- any breach of the director's duty of loyalty to the Company or its stockholders;
- acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law;

- unlawful payments of dividends or unlawful stock purchases or redemptions under Section 174 of the DGCL; or
- any transaction from which the director derived an improper personal benefit.

These limitations of liability do not alter director liability under the federal securities laws and do not affect the availability of equitable remedies such as an injunction or rescission.

The Company has obtained liability insurance for each director and officer for certain losses arising from claims or charges made against them while acting in their capacities as directors or officers of our company.

Item 7. Exemption from Registration Claimed.

Not applicable.

Item 8. Exhibits.

See the Exhibit Index on the page immediately preceding the signatures to this Registration Statement for a list of exhibits filed as part of this Registration Statement, which Exhibit Index is incorporated herein by reference.

Item 9. Undertakings.

(a) The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this Registration Statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the Registration Statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the Registration Statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective Registration Statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the Registration Statement or any material change to such information in the Registration Statement;

provided, however, that paragraphs (a)(1)(i) and (a)(1)(ii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the Registrant pursuant to Section 13 or Section 15(d) of the Exchange Act that are incorporated by reference in the Registration Statement.

(2) That, for the purpose 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 remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(b) The undersigned Registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the Registrant's annual report pursuant to Section 13(a) or 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in this Registration Statement 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.

(c) 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 Securities and Exchange Commission 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.

EXHIBIT INDEX

<u>Exhibit No.</u>	<u>Description</u>
4.1	<u>Fifth Amended and Restated Certificate of Incorporation of Assembly Biosciences, Inc. (incorporated by reference to Exhibit 3.1 of the Registrant's Current Report on Form 8-K filed with the Commission on June 16, 2020).</u>
4.2	<u>Amended and Restated Bylaws of Assembly Biosciences, Inc., as amended on June 12, 2020 (incorporated by reference to Exhibit 3.2 of the Registrant's Current Report on Form 8-K filed with the Commission on June 16, 2020).</u>
4.3	<u>Specimen Common Stock Certificate of Assembly Biosciences, Inc. (incorporated by reference to Exhibit 4.1 of the Registrant's Registration Statement on Form S-3 filed with the Commission on December 30, 2015).</u>
5.1	<u>Opinion of Skadden, Arps, Slate, Meagher & Flom LLP.</u>
23.1	<u>Consent of Skadden, Arps, Slate, Meagher & Flom LLP (included in Exhibit 5.1).</u>
23.2	<u>Consent of Independent Registered Public Accounting Firm.</u>
24.1	<u>Power of Attorney (included on the signature page of this Registration Statement).</u>
99.1	<u>Assembly Biosciences, Inc. 2018 Stock Incentive Plan (incorporated by reference to Exhibit 10.1 of the Registrant's Current Report on Form 8-K filed with the Commission on June 1, 2018).</u>
99.2	<u>Amendment No. 1 to Assembly Biosciences, Inc. 2020 Stock Incentive Plan (incorporated by reference to Exhibit 10.2 of the Registrant's Current Report on Form 8-K filed with the Commission on May 21, 2019).</u>
99.3	<u>Omnibus Amendment to Assembly Biosciences, Inc. Stock Incentive Plans (incorporated by reference to Exhibit 10.2 of the Registrant's Quarterly Report on Form 10-Q filed with the Commission on May 7, 2020).</u>
99.3	<u>Amendment No. 3 to Assembly Biosciences, Inc. 2020 Stock Incentive Plan (incorporated by reference to Exhibit 10.1 of the Registrant's Current Report on Form 8-K filed with the Commission on June 16, 2020).</u>
99.4	<u>Assembly Biosciences, Inc. 2020 Inducement Award Plan (incorporated by reference to Exhibit 10.3 of the Registrant's Quarterly Report on Form 10-Q filed with the Commission on May 7, 2020).</u>
99.5	<u>Form of Notice of Stock Option Grant and Stock Option Agreement under the Assembly Biosciences, Inc. 2020 Inducement Award Plan (incorporated by reference to Exhibit 10.4 of the Registrant's Quarterly Report on Form 10-Q filed with the Commission on May 7, 2020).</u>
99.6	<u>Form of Restricted Stock Unit Award Notice Restricted Stock Unit Award Agreement under the Assembly Biosciences, Inc. 2020 Inducement Award Plan (incorporated by reference to Exhibit 10.5 of the Registrant's Quarterly Report on Form 10-Q filed with the Commission on May 7, 2020).</u>

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of South San Francisco, State of California, on August 28, 2020.

Assembly Biosciences, Inc.

By: /s/ John G. McHutchison, A.O., M.D.

John G. McHutchison, A.O., M.D.
Chief Executive Officer and President

POWER OF ATTORNEY AND SIGNATURES

We, the undersigned officers and directors of Assembly Biosciences, Inc., hereby severally constitute and appoint John G. McHutchison, A.O., M.D., Thomas J. Russo and Jason A. Okazaki, and each of them singly (with full power to each of them to act alone), our true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution in each of them for him/her and in his/her name, place and stead, and in any and all capacities, to sign for us and in our names in the capacities indicated below any and all amendments (including post-effective amendments) to this registration statement on Form S-8, and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises, as full to all intents and purposes as he/she might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or any of them, or their or his/her substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons on August 28, 2020 in the capacities indicated.

<u>Signature</u>	<u>Title</u>
<u>/s/ John G. McHutchison, A.O., M.D.</u> John G. McHutchison, A.O., M.D.	Director, Chief Executive Officer and President (Principal Executive Officer)
<u>/s/ Thomas J. Russo</u> Thomas J. Russo	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)
<u>/s/ William R. Ringo, Jr.</u> William R. Ringo, Jr.	Chairman of the Board
<u>/s/ Anthony E. Altig</u> Anthony E. Altig	Director
<u>/s/ Richard D. DiMarchi, Ph.D.</u> Richard D. DiMarchi, Ph.D.	Director
<u>/s/ Myron Z. Holubiak</u> Myron Z. Holubiak	Director
<u>/s/ Helen S. Kim</u> Helen S. Kim	Director
<u>/s/ Alan J. Lewis, Ph.D.</u> Alan J. Lewis, Ph.D.	Director
<u>/s/ Susan Mahony, Ph.D.</u> Susan Mahony, Ph.D.	Director

SKADDEN, ARPS, SLATE, MEAGHER & FLOM LLP
 300 SOUTH GRAND AVENUE
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FIRM/AFFILIATE
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August 28, 2020

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 TOKYO
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Assembly Biosciences, Inc.
 331 Oyster Point Blvd., Fourth Floor
 South San Francisco, California 94080

Re: Assembly Biosciences, Inc.
Registration Statement on Form S-8

Ladies and Gentlemen:

We have acted as special United States counsel to Assembly Biosciences, Inc., a Delaware corporation (the "Company"), in connection with its filing with the Securities and Exchange Commission (the "Commission") of a registration statement on Form S-8 (the "Registration Statement") under the Securities Act of 1933 (the "Securities Act") on the date hereof, relating to the registration by the Company of (i) an aggregate of 1,600,000 shares (the "2018 Plan Shares") of common stock of the Company, par value \$0.001 per share (the "Common Stock"), for issuance pursuant to the Assembly Biosciences, Inc. 2018 Stock Incentive Plan, effective as of May 30, 2018 (the "2018 Original Plan"), as amended by Amendment No. 1 to Assembly Biosciences, Inc. 2018 Stock Incentive Plan, effective as of May 17, 2019 (the "2018 Plan Amendment No. 1"), as further amended by the Omnibus Amendment to Assembly Biosciences, Inc. Stock Plans, effective as of March 11, 2020 (the "Omnibus Amendment"), and as further amended by Amendment No. 3 to the Assembly Biosciences, Inc. 2018 Stock Incentive Plan, effective as of June 11, 2020 (the "2018 Plan Amendment No. 3"; the 2018 Original Plan, as amended by the 2018 Plan Amendment No. 1, the Omnibus Amendment and the 2018 Plan Amendment No. 3, the "2018 Plan"), and (ii) an aggregate of 800,000 shares (the "2020 Plan Shares," and, together with the 2018 Plan Shares, the "Plan Shares") of Common Shares, for issuance pursuant to the Assembly Biosciences, Inc. 2020 Inducement Award Plan (the "2020 Plan").

This opinion is being furnished in accordance with the requirements of Item 601(b)(5) of Regulation S-K under the Securities Act.

In rendering the opinions stated herein, we have examined and relied upon the following:

- (a) the Registration Statement;
- (b) an executed copy of a certificate, dated the date hereof, of Jason Okazaki, Corporate Secretary of the Company (the "Secretary's Certificate");
- (c) copies of the Company's (i) Third Amended and Restated Certificate of Incorporation, as amended, as in effect to May 31, 2018 and certified pursuant to the Secretary's Certificate, (ii) Fourth Amended and Restated Certificate of Incorporation, as in effect from May 31, 2018 to June 11, 2020 and certified pursuant to the Secretary's Certificate and (iii) Fifth Amended and Restated Certificate of Incorporation, as in effect from June 11, 2020, certified by the Secretary of State of the State of Delaware as of August 25, 2020 (the "Current Charter"), and certified pursuant to the Secretary's Certificate;
- (d) a copy of the Company's (i) Amended and Restated Bylaws as in effect to August 6, 2019 and certified pursuant to the Secretary's Certificate, (ii) Amended and Restated Bylaws as in effect to June 12, 2020 and certified pursuant to the Secretary's Certificate, and (iii) Amended and Restated Bylaws, as in effect since June 12, 2020 and as in effect as of the date hereof (the "Current Bylaws") and certified pursuant to the Secretary's Certificate;
- (e) copies of certain resolutions of the Board of Directors of the Company, and of the Compensation Committee of the Board of Directors of the Company, certified pursuant to the Secretary's Certificate;
- (f) the report of the inspector of elections of each of the 2018 Annual Meeting of the Stockholders of the Company, the 2019 Annual Meeting of Stockholders of the Company and the 2020 Annual Meeting of the Stockholders of the Company reflecting approval of the 2018 Original Plan, the 2018 Plan Amendment No. 1 and the 2018 Plan Amendment No. 3, respectively, each certified pursuant to the Secretary's Certificate; and
- (g) copies of the 2018 Original Plan, the 2018 Plan Amendment No. 1, the Omnibus Amendment and the 2018 Plan Amendment No. 3; and
- (h) a copy of the 2020 Plan.

We have also examined originals or copies, certified or otherwise identified to our satisfaction, of such records of the Company and such agreements, certificates and receipts of public officials, certificates of officers or other representatives of the Company and others, and such other documents as we have deemed necessary or appropriate as a basis for the opinions set forth herein.

In our examination, we have assumed the genuineness of all signatures, including electronic signatures, the legal capacity and competency of all natural persons, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as facsimile, electronic, certified or photocopied copies, and the authenticity of the originals of such copies. As to any facts relevant to the opinions stated herein that we did not independently establish or verify, we have relied upon statements and representations of officers and other representatives of the Company and others and of public officials, including the facts and conclusions set forth in the Secretary's Certificate.

In rendering the opinions stated herein, we have also assumed that: (i) an appropriate account statement evidencing the Plan Shares credited to a recipient's account maintained with the Company's transfer agent has been or will be issued by the Company's transfer agent, (ii) the issuance of the Plan Shares has been properly recorded in the books and records of the Company; (iii) each award agreement pursuant to which rights to acquire Plan Shares or other awards are granted pursuant to the Plan will be consistent with the Plan and will be duly authorized, executed and delivered by the parties thereto, including, in the case of the 2020 Plan, duly authorized and approved by the Company's independent Compensation Committee or a majority of the Company's independent directors (as defined in the 2020 Plan) pursuant to Rule 5635(c)(4) of the Nasdaq Listing Rules; and (iv) the consideration received by the Company for each of the Plan Shares delivered pursuant to the Plan shall not be less than the per share par value of the Plan Shares.

We do not express any opinion with respect to the laws of any jurisdiction other than the General Corporation Law of the State of Delaware (the "DGCL").

Based upon the foregoing and subject to the qualifications and assumptions stated herein, we are of the opinion that the Plan Shares have been duly authorized by all requisite corporate action on the part of the Company under the DGCL and, when issued, delivered and paid for in accordance with the terms of the Plan and the applicable award agreement, the Plan Shares will be validly issued, fully paid and nonassessable.

In addition, in rendering the foregoing opinion we have assumed that:

(a) the issuance of the Plan Shares (i) does not and will not constitute a violation of, or a default under, any lease, indenture, agreement or other instrument to which the Company or its property is subject (except that we do not make this assumption with respect to the Current Charter or Current Bylaws), (ii) does not and will not contravene any order or decree of any governmental authority to which the Company or its property is subject, and (iii) does not and will violate any law, rule or regulation to which the Company or its property is subject (except that we do not make the assumption set forth in this clause (iii) with respect to the DGCL); and

(b) the issuance of the Plan Shares does not and will not require the consent, approval, licensing or authorization of, or any filing, recording or registration with, any governmental authority under any law, rule or regulation of any jurisdiction.

We hereby consent to the filing of this opinion with the Commission as Exhibit 5.1 to the Registration Statement. In giving this consent, we do not thereby admit that we are included in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission promulgated thereunder. This opinion is expressed as of the date hereof unless otherwise expressly stated, and we disclaim any undertaking to advise you of any subsequent changes in the facts stated or assumed herein or of any subsequent changes in applicable laws.

Very truly yours,

/s/ Skadden, Arps, Slate, Meagher & Flom 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 Assembly Biosciences, Inc. 2018 Stock Incentive Plan and Assembly Biosciences, Inc. 2020 Inducement Award Plan of our reports dated March 4, 2020, with respect to the consolidated financial statements and related notes of Assembly Biosciences, Inc. and the effectiveness of internal control over financial reporting of Assembly Biosciences, Inc. included in its Annual Report (Form 10-K) for the year ended December 31, 2019, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP
Redwood City, California
August 28, 2020