As filed with the Securities and Exchange Commission on August 20, 2026

Registration No. 333-

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.)
Two Tower Place, 7th Floor **South San Francisco, California** (Address of Principal Executive Offices)	**94080** (Zip Code)

Assembly Biosciences, Inc. Amended and Restated 2018 Stock Incentive Plan
Assembly Biosciences, Inc. Second Amended and Restated 2018 Employee Stock Purchase Plan
(Full title of the plan)

Jason A. Okazaki
Chief Executive Officer and President
Assembly Biosciences, Inc.
Two Tower Place, 7th 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
2000 Avenue of the Stars
Suite 200N
Los Angeles, California 90067
(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 ☐	Accelerated filer ☐
Non-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. ☐

EXPLANATORY NOTE

Pursuant to General Instruction E to Form S-8 under the Securities Act, this Registration Statement is being filed by Assembly Biosciences, Inc. (the "Company" or the "Registrant") for the purpose of registering additional shares of the Company's common stock, par value $0.001 per share (the "Common Stock") under (1) the Assembly Biosciences, Inc. Amended and Restated 2018 Stock Incentive Plan, as amended (the "2018 Plan"), and (2) the Assembly Biosciences, Inc. Second Amended and Restated 2018 Employee Stock Purchase Plan, as amended (the "2018 ESPP").

On April 22, 2026, the Company filed with the Securities and Exchange Commission (the "Commission") a definitive proxy statement (the "Proxy Statement") that included a proposal to increase the number of shares reserved for issuance under the 2018 Plan by 1,200,000 shares of Common Stock for general purposes. This Registration Statement registers the 1,200,000 aggregate additional shares of Common Stock reserved for issuance under the 2018 Plan.

The Proxy Statement also included a proposal to increase the number of shares reserved for issuance under the 2018 ESPP by 290,000 shares of Common Stock. This Registration Statement registers the 290,000 additional shares of Common Stock reserved for issuance under the 2018 ESPP.

On February 9, 2024, we effectuated a 1-for-12 reverse stock split (the "Reverse Stock Split"), which also impacted the number of shares reserved for issuance under our equity plans, including the 2018 Plan and the 2018 ESPP. As a result of the Reverse Stock Split, as of February 9, 2024, the number of shares of Common Stock that were registered for issuance under the 2018 Plan was reduced from 10,600,000 shares to 833,333 shares, and the number of shares that were registered for issuance under the 2018 ESPP was reduced from 1,300,000 shares to 108,333 shares. Both plans were amended and restated in 2024, and additional shares for the two plans were registered pursuant to a Registration Statement on Form S-8 (Registration No. 333-281388) filed on August 8, 2024.

Prior Registration Statements

The 1,200,000 additional shares of Common Stock reserved for issuance under the 2018 Plan registered pursuant to this Registration Statement are of the same class of securities as the shares of Common Stock registered for issuance under the 2018 Plan pursuant to the following currently effective registration statements: (1) the Registration Statement on Form S-8 (Registration No. 333-226703) filed on August 8, 2018 (the "Original 2018 Plan Registration Statement"), (2) the Registration Statement on Form S-8 (Registration No. 333-233030) filed on August 5, 2019 (the "Second 2018 Plan Registration Statement"), (3) the Registration Statement on Form S-8 (Registration No. 333-248476) filed on August 28, 2020 (the "Third 2018 Plan Registration Statement"), (4) the Registration Statement on Form S-8 (Registration No. 333-258516) filed on August 5, 2021 (the "Fourth 2018 Plan Registration Statement"), (5) Registration Statement on Form S-8 (Registration No. 333-266711) filed on August 9, 2022 (the "Fifth 2018 Plan Registration Statement"), (6) Registration Statement on Form S-8 (Registration No. 333-273836) filed on August 9, 2023 (the "Sixth 2018 Plan Registration Statement"), (7) Registration Statement on Form S-8 (Registration No. 333-281388) (the "Seventh 2018 Plan Registration Statement") filed on August 8, 2024 and (8) Registration Statement on Form S-8 (Registration No. 333-289300) filed on August 6, 2025 (the "Eighth 2018 Plan Amendment").

The contents of the Original 2018 Plan Registration Statement, the Second 2018 Plan Registration Statement, the Third 2018 Plan Registration Statement, the Fourth 2018 Plan Registration Statement, the Fifth 2018 Plan Registration Statement, the Sixth 2018 Plan Registration Statement, the Seventh 2018 Plan Registration Statement and the Eighth 2018 Plan Amendment, including any amendments thereto or filings incorporated therein, are incorporated herein by reference. Any items in the Original 2018 Plan Registration Statement, the Second 2018 Plan Registration Statement, the Third 2018 Plan Registration Statement, the Fourth 2018 Plan Registration Statement, the Fifth 2018 Plan Registration Statement, the Sixth Registration Statement, the Seventh 2018 Plan Registration Statement and the Eighth 2018 Plan Amendment not expressly changed by this Registration Statement shall be as set forth in the Original 2018 Plan Registration Statement, the Second 2018 Plan Registration Statement, the Third 2018 Plan Registration Statement, the Fourth 2018 Plan Registration Statement, the Fifth 2018 Plan Registration Statement, the Sixth 2018 Plan Registration, the Seventh 2018 Plan Registration Statement and the Eighth 2018 Plan Amendment, as applicable.

The 290,000 additional shares of Common Stock reserved for issuance under the 2018 ESPP registered pursuant to this Registration Statement are of the same class of securities as the shares of Common Stock registered for issuance under the 2018 ESPP pursuant to the following currently effective registration statements: (1) the Registration

Statement on Form S-8 (Registration No. 333-226,703) filed on August 8, 2018 (the “Original 2018 ESPP Registration Statement”), (2) the Registration Statement on Form S-8 (Registration No. 333-258516) filed on August 5, 2021 (the “Second 2018 ESPP Registration Statement”), (3) the Registration Statement on Form S-8 (Registration No. 333-281388) filed on August 8, 2024, (the “Third 2018 ESPP Registration Statement”) and the Registration Statement on Form S-8 (Registration Statement No. 333-289300) filed on August 6, 2025 (the "Fourth 2018 ESPP Registration Statement"). The contents of the Original 2018 ESPP Registration Statement, the Second 2018 ESPP Registration Statement, the Third 2018 ESPP Registration Statement and the Fourth 2018 ESPP Registration Statement, including any amendments thereto or filings incorporated therein, are incorporated herein by reference. Any items in the Original 2018 ESPP Registration Statement, the Second 2018 ESPP Registration Statement, the Third 2018 ESPP Registration Statement and the Fourth 2018 ESPP Registration Statement not expressly changed by this Registration Statement shall be as set forth in the Original 2018 ESPP Registration Statement, the Second 2018 ESPP Registration Statement, the Third 2018 ESPP Registration Statement and the Fourth 2018 ESPP Registration Statement, as applicable.

PART I

INFORMATION REQUIRED IN THE SECTION 10(a) PROSPECTUS

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. Such documents are not required to be, and are not, filed with 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.

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 the Company 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, 2025, filed with the Commission on March 19, 2026 (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 2026 Annual Meeting of Stockholders, filed with the Commission on April 23, 2026);
- the Company's Quarterly Reports on Form 10-Q for the quarters ended March 31, 2026 and June 30, 2026, filed with the Commission on May 7, 2026 and August 13, 2026, respectively;
- our Current Reports on Form 8-K filed with the SEC on March 30, 2026, May 22, 2026 (only Item 8.01), May 26, 2026 and June 5, 2026; 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 4.2 to the Company's Annual Report on Form 10-K for the year ended December 31, 2024, filed with the Commission on March 20, 2025.

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:

Two Tower Place, 7th 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.

Not applicable.

Item 6. Indemnification of Directors and Officers.

Not applicable.

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.

Not required to be filed with this Registration Statement pursuant to General Instruction E to Form S-8.

EXHIBIT INDEX

Exhibit No.	Description
4.1	Sixth Amended and Restated Certificate of Incorporation of Assembly Biosciences, Inc. (incorporated by reference to Exhibit 3.1 of the Registrant's Annual Report on Form 10-K filed with the Commission on March 28, 2024).
4.2	Certificate of Amendment to Sixth Amended and Restated Certificate of Incorporation of Assembly Biosciences, Inc., dated February 9, 2024 (incorporated by reference to Exhibit 3.1 to the Registrant's Current report on Form 8-K filed on February 13, 2024).
4.3	Amended and Restated Bylaws of Assembly Biosciences, Inc., as amended on December 12, 2024 (incorporated by reference to Exhibit 3.1 of the Registrant's Current Report on Form 8-K filed with the Commission on December 13, 2024).
4.4	Specimen Common Stock Certificate of Assembly Biosciences, Inc. (incorporated by reference to Exhibit 4.1 of the Registrant's Registration Statement on 10-K filed with the Commission on March 20, 2025).
5.1	Opinion of Skadden, Arps, Slate, Meagher & Flom LLP.
23.1	Consent of Skadden, Arps, Slate, Meagher & Flom LLP (included in Exhibit 5.1).
23.2	Consent of Independent Registered Public Accounting Firm.
24.1	Power of Attorney (included on the signature page of this Registration Statement).
99.1	Assembly Biosciences, Inc. Amended and Restated 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 3, 2024).
99.2	Amendment No. 1 to Assembly Biosciences, Inc. Amended and Restated 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 9, 2025).
99.3	Amendment No. 2 to Assembly Biosciences, Inc. Amended and Restated 2018 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 June 9, 2025).
99.4	Amendment No. 3 to Assembly Biosciences, Inc. Amended and Restated 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 5, 2026.
99.5	Assembly Biosciences, Inc. Second Amended and Restated 2018 Employee Stock Purchase Plan (incorporated by reference to Exhibit 10.2 of the Registrant's Current Report on Form 8-K filed with the Commission on June 3, 2024).
99.6	Amendment No. 1 to Assembly Biosciences, Inc. Second Amended and Restated 2018 Employee Stock Purchase Plan (incorporated by reference to Exhibit 10.3 of the Registrant's Current Report on Form 8-K filed with the Commission on June 9, 2025).
99.7	Amendment No. 2 to Assembly Biosciences, Inc. Second Amended and Restated 2018 Employee Stock Purchase Plan (incorporated by reference to Exhibit 10.2 of the Registrant's Current Report on Form 8-K filed with the Commission on June 5, 2026).
107	Filing Fees.

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 20, 2026.

Assembly Biosciences, Inc.

By: /s/ Jason A. Okazaki
Jason A. Okazaki
Chief Executive Officer and President

POWER OF ATTORNEY

We, the undersigned officers and directors of Assembly Biosciences, Inc., hereby severally constitute and appoint Jason A. Okazaki and John O. Gunderson, 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 20, 2026 in the capacities indicated.

Signature	Title
/s/ Jason A. Okazaki Jason A. Okazaki	Director, Chief Executive Officer and President (Principal Executive Officer)
/s/ Jeanette M. Bjorkquist Jeanette M. Bjorkquist	Vice President, Finance (Principal Financial Officer and Principal Accounting Officer)
/s/ Anthony E. Altig Anthony E. Altig	Chairman of the Board
/s/ Tomas Cihlar, Ph.D. Thomas Cihlar, Ph.D.	Director
/s/ Gina Consylman Gina Consylman	Director
/s/ Robert D. Cook II Robert D. Cook II	Director
/s/ Michael Houghton, Ph.D. Michael Houghton, Ph.D.	Director
/s/ Lisa R. Johnson-Pratt, M.D. Lisa R. Johnson-Pratt, M.D.	Director
/s/ Susan Mahony, Ph.D. Susan Mahony, Ph.D.	Director
/s/ John G. McHutchison, A.O., M.D. John G. McHutchison, A.O., M.D.	Director

Exhibit 5.1

SKADDEN, ARPS, SLATE, MEAGHER & FLOM LLP
2000 AVENUE OF THE STARS
LOS ANGELES, CALIFORNIA 90067-4732

TEL: (213) 687-5000
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MUNICH
PARIS
SÃO PAULO
SEOUL
SINGAPORE
TOKYO
TORONTO

August 20, 2026

Assembly Biosciences, Inc.
Two Tower Place, 7th 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 an aggregate of (i) 1,200,000 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 the 2018 Original Plan, effective as of May 17, 2019 (the "2018 Plan Amendment No. 1"), as further amended by the Omnibus Amendment to the 2018 Original Plan, effective as of March 11, 2020 (the "Omnibus Amendment"), as further amended by Amendment No. 3 to the 2018 Original Plan, effective as of June 11, 2020 (the "2018 Plan Amendment No. 3"), as further amended by Amendment No. 4 to the 2018 Original Plan, effective as of May 20, 2021 (the "2018 Plan Amendment No. 4"), as further amended by Amendment No. 5 to the 2018 Original Plan, effective as of May 25, 2022 (the "2018 Plan Amendment No. 5"), as further amended by Amendment No. 6 to the 2018 Original Plan, effective as of May 25, 2023 (the "2018 Plan Amendment No. 6"), and as further amended by the Assembly Biosciences, Inc. Amended and Restated 2018 Stock Incentive Plan, effective as of May 29, 2024 (the "Amended and Restated 2018 Plan"), as further amended by Amendment No. 1 to the Amended and Restated 2018 Plan, effective as of June 5, 2025 (the "Amended and Restated 2018 Plan Amendment No. 1"), as further amended by Amendment No. 2 to the Amended and Restated 2018 Plan, effective as of June 5, 2025 (the "Amended and Restated 2018 Plan Amendment No. 2") and as further amended by Amendment No. 3 to the Amended and Restated 2018 Plan, effective as of June 4, 2026 (the "Amended and Restated 2018 Plan Amendment No. 3" and the 2018 Original Plan, as amended by the 2018 Plan Amendment No. 1, the Omnibus Amendment, the 2018 Plan Amendment No. 3, the 2018 Plan Amendment No. 4, the 2018 Plan Amendment No. 5, the 2018 Plan Amendment No. 6, the Amended and Restated 2018 Plan, the Amended and Restated 2018 Plan Amendment No. 1, the Amended and Restated 2018 Plan Amendment No. 2 and the Amended and Restated 2018 Plan Amendment No. 3, the "2018 Plan"), and (ii) 290,000 additional shares (the "2018 ESPP Shares" and, together with the 2018 Plan Shares, the "Plan Shares") of Common Stock for issuance pursuant to the Assembly Biosciences, Inc. 2018 Employee Stock Purchase Plan (the "2018 Original ESPP"), as further amended by the Assembly Biosciences, Inc. Amended and Restated 2018 Employee Stock Purchase Plan (the "Amended and Restated 2018 ESPP"), as further amended by the Assembly Biosciences, Inc. Second Amended and Restated 2018 Employee Stock Purchase Plan (the "Second Amended and Restated 2018 ESPP"), as further amended by the Amendment No. 1 to the Second Amended and Restated 2018 Employee Stock Purchase Plan (the "Second Amended and Restated 2018 ESPP Amendment No. 1") and as further amended by the Amendment No. 2 to the Second Amended and Restated 2018 Employee Stock Purchase Plan (the "Second Amended and Restated 2018 ESPP Amendment No. 2" and the 2018 Original ESPP, as amended by the Amended and Restated 2018 ESPP, the Second Amended and Restated 2018 ESPP, the Second Amended and Restated 2018 ESPP Amendment No. 1 and the Second Amended and Restated 2018 ESPP Amendment No. 2, the "2018 ESPP").

This opinion letter 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 John Gunderson, Vice President, General Counsel and 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, and certified pursuant to the Secretary's Certificate as being in effect to May 31, 2018, (ii) Fourth Amended and Restated Certificate of Incorporation, and certified pursuant to the Secretary's Certificate as being in effect from May 31, 2018 to June 11, 2020, (iii) Fifth Amended and Restated Certificate of Incorporation, and certified pursuant to the Secretary's Certificate as being in effect from June 11, 2020 to May 25, 2022, (iv) Sixth Amended and Restated Certificate of Incorporation, and certified pursuant to the Secretary's Certificate as being in effect from May 25, 2022 to February 9, 2024, and (v) Sixth Amended and Restated Certificate of Incorporation, as amended, certified by the Secretary of State of the State of Delaware as of the date hereof (the "Current Charter"), and certified pursuant to the Secretary's Certificate as being in effect from February 9, 2024 and as of the date hereof;

(d) a copy of the Company's (i) Amended and Restated Bylaws and certified pursuant to the Secretary's Certificate as being in effect as of April 8, 2016 to January 24, 2018, (ii) Amended and Restated Bylaws and certified pursuant to the Secretary's Certificate as in being effect from January 24, 2018 to August 6, 2019, (iii) Amended and Restated Bylaws, as amended, and certified pursuant to the Secretary's Certificate as being in effect from August 6, 2019 to June 12, 2020, (iv) Amended and Restated Bylaws, and certified pursuant to the Secretary's Certificate as being in effect from June 12, 2020 to January 22, 2021, (v) Amended and Restated Bylaws, and certified pursuant to the Secretary's Certificate as being in effect from January 22, 2021 to December 7, 2022, (vi) Amended and Restated Bylaws, and certified pursuant to the Secretary's Certificate as being in effect from December 7, 2022 to December 12, 2024 and (vii) Amended and Restated Bylaws and certified pursuant to the Secretary's Certificate as being in effect since December 12, 2024 and as of the date hereof (the "Current Bylaws");

(e) copies of certain resolutions 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, the 2020 Annual Meeting of the Stockholders of the Company, the 2021 Annual Meeting of the Stockholders of the Company, the 2022 Annual Meeting of the Stockholders of the Company, the 2023 Annual Meeting of the Stockholders of the Company, the 2024 Annual Meeting of the Stockholders of the Company, the 2025 Annual Meeting of the Stockholders of the Company and the 2026 Annual Meeting of the Stockholders of the Company, as applicable, reflecting approval of the 2018 Original Plan, the 2018 Plan Amendment No. 1, the 2018 Plan Amendment No. 3, the 2018 Plan Amendment No. 4, the 2018 Plan Amendment No. 5, the 2018 Plan Amendment No. 6, the Amended and Restated 2018 Plan, the Amended and Restated 2018 Plan Amendment No. 1, the Amended and Restated 2018 Plan Amendment No. 2, the Amended and Restated 2018 Plan Amendment No. 3, the 2018 Original ESPP, the Amended and Restated 2018 ESPP, the Second Amended and Restated 2018 ESPP, the Second Amended and Restated 2018 ESPP Plan Amendment No. 1 and the Second Amended and Restated 2018 ESPP Plan Amendment No. 2, respectively, each certified pursuant to the Secretary's Certificate;

(g) copies of the 2018 Original Plan, the 2018 Plan Amendment No. 1, the Omnibus Amendment, the 2018 Plan Amendment No. 3, the 2018 Plan Amendment No. 4, the 2018 Plan Amendment No. 5, the 2018 Plan Amendment No. 6, the Amended and Restated 2018 Plan, the Amended and Restated 2018 Plan Amendment No. 1, the Amended and Restated 2018 Plan Amendment No. 2 and the Amended and Restated 2018 Plan Amendment No. 3;

(h) copies of the 2018 Original ESPP, the Amended and Restated 2018 ESPP, the Second Amended and Restated 2018 ESPP, the Second Amended and Restated 2018 ESPP Amendment No. 1 and the Second Amended and Restated 2018 ESPP Amendment No. 2; and

(i) the forms of award agreements under each of the 2018 Plan and the 2018 ESPP.

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 and the Current Charter.

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 2018 Plan and the 2018 ESPP will be consistent with the 2018 Plan and the 2018 ESPP, respectively, and will be duly authorized, executed and delivered by the parties thereto and (iv) the consideration received by the Company for each of the Plan Shares delivered pursuant to the 2018 Plan and the 2018 ESPP 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 2018 Plan or the 2018 ESPP, as applicable, and, in either case, the respective award agreement, the Plan Shares will be validly issued, fully paid and nonassessable.

In addition, in rendering the foregoing opinion we have assumed that the issuance of the Plan Shares does not and will not (a) violate any statute to which the Company or such issuance is subject (except that we do not make this assumption with respect to the DGCL), or (b) constitute a violation of, or a breach under, or require the consent or approval of any other person under, any agreement or instrument binding on the Company (except that we do not make this assumption with respect to the Current Charter and the Current Bylaws although we have assumed compliance with any covenant, restriction or provision with respect to financial ratios or tests or any aspect of the financial condition or results of operations of the Company contained in such instruments) and that the Company will continue to have sufficient authorized shares of Common Stock, and the Company's authorized capital stock is as set forth in the Current Charter and we have relied solely on the certified copy thereof issued by the Secretary of State of the State of Delaware and have not made any other inquiries or investigations.

We hereby consent to the filing of this opinion letter 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 letter 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

Exhibit 23.2

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. Amended and Restated 2018 Stock Incentive Plan and the Assembly Biosciences, Inc. Second Amended and Restated 2018 Employee Stock Purchase Plan of our report dated March 19, 2026, with respect to the consolidated financial statements of Assembly Biosciences, Inc., included in its Annual Report (Form 10-K) for the year ended December 31, 2025, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

San Jose, California
August 20, 2026

EXHIBIT 107

Calculation of Filing Fee Tables

Form S-8
(Form Type)

Assembly Biosciences, Inc.
(Exact Name of Registrant as Specified in its Charter)

Table 1: Newly Registered Securities

	Security Type	Security Class Title	Fee Calculation	Amount Registered[(1)]	Proposed Maximum Offering Price Per Share[(2)]	Maximum Aggregate Offering Price	Fee Rate	Amount of Registration Fee
Newly Registered Securities								
Fees to Be Paid	Equity	Common Stock, par value $0.001 per share	Other[(2)]	1,200,000	$31.55	$37,860,000	$138.10 per $1,000,000	$5,228.47
Fees to Be Paid	Equity	Common Stock, par value $0.001 per share	Other[(2)]	290,000	$31.55	$9,149,500	$138.10 per $1,000,000	$1,263.55
Total Offering Amounts						$47,009,500		$6,492.02
Total Fee Offsets								—
Net Fees Due								$6,492.02

(1) Represents (a) an aggregate of 1,200,000 additional shares of common stock, par value $0.001 per share (the "Common Stock"), reserved for issuance under the Assembly Biosciences, Inc. Amended and Restated 2018 Stock Incentive Plan, as amended (the "2018 Plan"), and (b) 290,000 additional shares of Common Stock reserved for issuance under the Assembly Biosciences, Inc. Second Amended and Restated 2018 Employee Stock Purchase Plan, as amended (the "2018 ESPP"). Pursuant to Rule 416 under the Securities Act of 1933, as amended (the "Securities Act"), this Registration Statement shall also register an indeterminate number of shares that may become issuable under the 2018 Plan and the 2018 ESPP 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) 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 17, 2026.