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

SCHEDULE 14A
(Rule 14a-101)
**Proxy Statement Pursuant to Section 14(a) of the
Securities Exchange Act of 1934**

Filed by Registrant

Filed by Party other than Registrant

Check the appropriate box:

- Preliminary Proxy Statement
- Confidential, for Use of the Commission Only (as permitted by Rule 14a-6(e)(2))**
- Definitive Proxy Statement
- Definitive Additional Materials
- Soliciting Materials Pursuant to §240.14a-12

Sensei Biotherapeutics, Inc.
(Name of Registrant as Specified In Its Charter)

(Name of Person(s) Filing Proxy Statement, if other than the Registrant)

Payment of Filing Fee (Check the appropriate box):

- No fee required
- Fee paid previously with preliminary materials
- Fee computed on table in exhibit required by Item 25(b) per Exchange Act Rules 14a-6(i)(1) and 0-11
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SENSEI BIOTHERAPEUTICS, INC.
1405 Research Boulevard, Suite 125
Rockville, Maryland 20850

PROXY STATEMENT SUPPLEMENT

Dated: May 22, 2026

The following disclosures in this proxy supplement (the "Supplement") supplement, and should be read in conjunction with, the disclosures contained in the definitive proxy statement (the "Definitive Proxy Statement") of Sensei Biotherapeutics, Inc. (the "Company"), filed with the Securities and Exchange Commission (the "SEC") on April 27, 2026, which in turn should be read in its entirety. The purpose of the Supplement is to provide an update regarding the expected reconstitution of the board of directors of the Company (the "Board") if the Required Company Stockholder Matters (as defined in the Definitive Proxy Statement) are approved. Due to personal reasons, Karen Vousden, Ph.D. has requested that her appointment be delayed until later in 2026; the Board intends to consider appointing her in the third or fourth quarter of 2026. If the Required Company Stockholder Matters are approved, the Board intends to appoint Bob Holmen as chair of the Nominating and Corporate Governance Committee effective June 12, 2026, when the other board appointments would become effective. The Board has also approved a Board size of five directors as of that date. To the extent the information set forth herein differs from or updates information contained in the Definitive Proxy Statement, the information set forth herein shall supersede or supplement the information in the Definitive Proxy Statement. All other information in the Definitive Proxy Statement remains unchanged. Terms used herein, unless otherwise defined, have the meanings set forth in the Definitive Proxy Statement.

The Board of Directors' recommendation with respect to each proposal set forth in the Definitive Proxy Statement remains unchanged.

Additional Information and Where You Can Find It

The Company has filed with the SEC the Definitive Proxy Statement and proxy cards with respect to the solicitation of proxies for its 2026 Annual Meeting of Stockholders to be held on June 10, 2026 at 11:00 a.m. Eastern Daylight Time through a live webcast at www.proxydocs.com/SNSE (the “Annual Meeting”). STOCKHOLDERS OF THE COMPANY ARE URGED TO READ THE DEFINITIVE PROXY STATEMENT, THIS SUPPLEMENT AND ANY OTHER RELEVANT DOCUMENTS THAT THE COMPANY HAS FILED OR WILL FILE WITH THE SEC BECAUSE THEY CONTAIN OR WILL CONTAIN IMPORTANT INFORMATION ABOUT THE COMPANY AND THE MATTERS TO BE VOTED ON AT THE ANNUAL MEETING. You may obtain these documents free of charge on the SEC’s website at www.sec.gov and on the Company’s website at www.sensebio.com. Stockholders may also obtain copies of the Definitive Proxy Statement and this Supplement, without charge, by contacting the Company’s Corporate Secretary at 1405 Research Boulevard, Suite 125, Rockville, Maryland 20850. The record date for the Annual Meeting is April 13, 2026.

Pursuant to SEC rules, the Company has elected to provide access to its proxy materials on the Internet instead of mailing printed copies of its proxy materials to all of its stockholders. Accordingly, the Company has sent a separate Notice of Internet Availability of Proxy Materials (the “Notice”) to its stockholders of record as of the record date. All stockholders of record will have the ability to access the proxy materials and the Company’s 2025 Annual Report on the website referred to in the Notice or request to receive a printed copy of the proxy materials and 2025 Annual Report. Instructions on how to access the proxy materials and the 2025 Annual Report on the Internet or request a printed copy may be found in the Notice.

No proxy cards are being furnished by this communication. Stockholders may vote their shares by using the directions on the Notice, or, if they elected to receive printed proxy materials by mail, on their proxy card, to vote by one of the following methods: (1) over the Internet before the Annual Meeting at www.proxypush.com/SNSE and during the Annual Meeting at www.proxydocs.com/SNSE, (2) by telephone by calling the toll-free number (866) 284-5317, or (3) if they elected to receive printed proxy materials by mail, by marking, dating, and signing their proxy card and returning it in the accompanying postage-paid envelope.

Participant Information

The Company and its directors, executive officers and certain of its employees are deemed to be “participants” (as defined in Section 14(a) of the Securities Exchange Act of 1934, as amended) in the solicitation of proxies from the Company’s stockholders in connection with the matters to be considered at the Annual Meeting. Information about the compensation of the Company’s named executive officers and non-employee directors is set forth in the sections titled “Executive Compensation” and “Director Compensation” in the Definitive Proxy Statement. Information regarding the participants’ holdings of the Company’s securities can be found in the section titled “Security Ownership of Certain Beneficial Owners and Management” in the Definitive Proxy Statement.

Forward-Looking Statements

This Supplement contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These forward-looking statements include, but are not limited to, statements regarding: (i) the expected reconstitution of the Board if the Required Company Stockholder Matters are approved; (ii) the anticipated timing and effectiveness of Board appointments, including the appointment of Bob Holmen as chair of the Nominating and Corporate Governance Committee; (iii) the Board’s intention to consider the appointment of Karen Vousden, Ph.D. in the third or fourth quarter of 2026; (iv) the anticipated size of the Board; and (v) other statements that are not historical facts. Forward-looking statements are generally identified by the use of words such as “anticipate,” “believe,” “could,” “estimate,” “expect,” “intend,” “may,” “plan,” “potential,” “predict,” “project,” “should,” “will,” “would,” and similar expressions. These forward-looking statements are based on the Company’s current expectations and assumptions and are subject to risks and uncertainties that could cause actual results to differ materially from those anticipated. Factors that could cause or contribute to such differences include, but are not limited to: (i) the receipt of stockholder approval of the Required Company Stockholder Matters; (ii) changes in the expected timing or composition of the reconstituted Board; and (iii) other risks and uncertainties described in the Company’s filings with the SEC, including the Definitive Proxy Statement. The Company undertakes no obligation to update or revise any forward-looking statements, whether as a result of new information, future events, or otherwise, except as required by applicable law.