

SCHEDULE 14A INFORMATION

Proxy Statement Pursuant to Section 14(a) of the
Securities Exchange Act of 1934
(Amendment No.)

Filed by the Registrant

Filed by a Party other than the 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 Material Pursuant to §240.14a-12

Spruce Biosciences, Inc.
(Name of Registrant as Specified In Its Charter)

N/A

(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.

SPRUCE BIOSCIENCES, INC.
611 Gateway Boulevard, Suite 740
South San Francisco, California 94080



NOTICE OF ANNUAL MEETING OF STOCKHOLDERS

To Be Held On June 9, 2025

Dear Stockholder:

You are cordially invited to attend the 2025 Annual Meeting of Stockholders (the "Annual Meeting") of Spruce Biosciences, Inc., a Delaware corporation (the "Company"). The Annual Meeting will be held on Monday, June 9, 2025, at 10:00 a.m. (Pacific Time). The Annual Meeting will be held through a live webcast at www.virtualshareholdermeeting.com/SPRB2025. You will not be able to attend the meeting in person. The Annual Meeting is being held for the following purposes:

1. To elect the three Class II directors named below to hold office until the Company's 2028 annual meeting of stockholders.

Nominees:

Percival-Baretto-Ko
Bali Muralidhar, M.D., Ph.D.
Daniel Spiegelman

2. To ratify the selection by the Audit Committee of the Board of Directors of BDO USA, P.C. as the independent registered public accounting firm of the Company for the Company's fiscal year ending December 31, 2025.
3. To approve an amendment to the Company's Amended and Restated Certificate of Incorporation to effect a reverse stock split (the "Reverse Stock Split") of the Company's common stock by a ratio of between one-for-five and one-for-thirty, with the exact ratio to be determined by the Board in its sole discretion and with such Reverse Stock Split to be effected at such time and date, if at all, as determined by the Board in its sole discretion ("Proposal 3" or the "Reverse Stock Split Proposal");
4. To approve the adjournment of the Annual Meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal 3 (the "Adjournment Proposal"); and
5. To conduct any other business properly brought before the Annual Meeting.

These items of business are more fully described in the Proxy Statement accompanying this Notice.

The Annual Meeting will be held virtually through a live webcast. You will be able to attend the Annual Meeting, submit questions and vote during the live webcast by visiting www.virtualshareholdermeeting.com/SPRB2025 and entering the 16-digit Control Number included in your Notice of Internet Availability or in the instructions that you received via email. Please refer to the additional logistical details and recommendations in the accompanying proxy statement. You may log-in beginning at 9:45 a.m. (Pacific Time), on Monday, June 9, 2025.

The record date for the Annual Meeting is April 10, 2025. Only stockholders of record at the close of business on that date may vote at the Annual Meeting or any adjournment thereof. The proxy materials, including this Proxy Statement and our 2024 Annual Report, are being distributed and made available on or about April 28, 2025.

**Important Notice Regarding the Availability of Proxy Materials for the Annual Meeting to Be Held on
June 9, 2025 at 10:00 a.m. (Pacific Time).**

The Proxy Statement and Annual Report to stockholders are available at www.proxyvote.com.

By Order of the Board of Directors

A handwritten signature in black ink, appearing to read "J. Szwarcberg". The signature is written in a cursive style with a horizontal line underneath.

Javier Szwarcberg, M.D., MPH
Chief Executive Officer
South San Francisco, California
April 28, 2025

You are cordially invited to virtually attend the Annual Meeting online. Whether or not you expect to virtually attend the Annual Meeting, please complete, date, sign and return the proxy mailed to you, or vote over the telephone or the internet as instructed in these materials, as promptly as possible in order to ensure your representation at the Annual Meeting. Voting instructions are provided in the Notice of Internet Availability of Proxy Materials or, if you receive a paper proxy card by mail, the instructions are printed on your proxy card.

Even if you have voted by proxy, you may still vote online if you virtually attend the Annual Meeting. Please note, however, that if your shares are held of record by a broker, bank or other nominee and you wish to vote at the Annual Meeting, you must obtain a proxy issued in your name from that record holder.

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SPRUCE BIOSCIENCES, INC.
611 Gateway Boulevard, Suite 740
South San Francisco, California 94080

PROXY STATEMENT
FOR THE 2025 ANNUAL MEETING OF STOCKHOLDERS

TO BE HELD ON JUNE 9, 2025

QUESTIONS AND ANSWERS ABOUT THESE PROXY MATERIALS AND VOTING

Why did I receive a notice regarding the availability of proxy materials on the internet?

Pursuant to rules adopted by the Securities and Exchange Commission (the “SEC”), we have elected to provide access to our proxy materials over the internet. Accordingly, we have sent you a Notice of Internet Availability of Proxy Materials (the “Notice”) because the Board of Directors (the “Board”) of Spruce Biosciences, Inc. (sometimes referred to as “we,” “us,” “our,” or the “Company”) is soliciting your proxy to vote at the 2025 Annual Meeting of Stockholders (the “Annual Meeting”), including at any adjournments or postponements of the Annual Meeting. All stockholders will have the ability to access the proxy materials on the website referred to in the Notice or request to receive a printed set of the proxy materials. Instructions on how to access the proxy materials over the internet or to request a printed copy may be found in the Notice.

We intend to first mail the Notice and make this proxy statement and the form of proxy available on or about April 28, 2025 to all stockholders of record entitled to vote at the Annual Meeting.

Will I receive any other proxy materials by mail?

We may send you a proxy card, along with a second Notice, ten calendar days after our first mailing of the Notice or thereafter.

Why are you holding a virtual Annual Meeting?

The Annual Meeting will be held through a live webcast at www.virtualshareholdermeeting.com/SPRB2025. You will not be able to attend the Annual Meeting in person. If you attend the Annual Meeting online, you will be able to vote and submit questions, at www.virtualshareholdermeeting.com/SPRB2025.

How do I attend the Annual Meeting?

You are entitled to attend the Annual Meeting if you were a stockholder as of the close of business on April 10, 2025, the record date (the “Record Date”). To be admitted to the Annual Meeting, you will need to visit www.virtualshareholdermeeting.com/SPRB2025 and enter the 16-digit Control Number found next to the label “Control Number” on your Notice of Internet Availability, proxy card or voting instruction form. Whether or not you participate in the Annual Meeting, it is important that you vote your shares. We encourage you to access the Annual Meeting before it begins. Online check-in will start approximately fifteen minutes before the meeting on June 9, 2025.

What if I cannot find my Control Number?

If you encounter any difficulties while accessing the virtual meeting during the check-in or meeting time, a technical assistance phone number will be made available on the virtual meeting registration page 15 minutes prior to the start of the meeting. You will be able to login as a guest. To view the meeting webcast visit www.virtualshareholdermeeting.com/SPRB2025 and register as a guest. If you login as a guest, you will not be able to vote your shares or ask questions during the meeting.

If you are a beneficial owner (that is, you hold your shares in an account at a bank, broker or other holder of record), and you lost your control number, you will need to contact that bank, broker or other holder of record to obtain your Control Number.

For the Annual Meeting, how do I ask questions of management and the board?

We plan to have a Q&A session at the Annual Meeting and will include as many stockholder questions as the allotted time permits. Questions may be submitted during the Annual Meeting through www.virtualshareholdermeeting.com/SPRB2025.

If I miss the Annual Meeting, will there be a copy posted online?

Yes, a replay of the Annual Meeting webcast will be available at our website at <https://investors.sprucebio.com/> and remain for at least ninety days.

Who can vote at the Annual Meeting?

Only stockholders of record at the close of business on the Record Date will be entitled to vote at the Annual Meeting. On the Record Date, there were 42,231,285 shares of common stock outstanding and entitled to vote.

Stockholder of Record: Shares Registered in Your Name

If on the Record Date your shares were registered directly in your name with our transfer agent, Computershare Trust Company, N.A., then you are a stockholder of record. We urge you to fill out and return the proxy card that may be mailed to you or vote by proxy over the telephone or on the internet as instructed below to ensure your vote is counted.

Beneficial Owner: Shares Registered in the Name of a Broker or Bank

If on the Record Date your shares were held, not in your name, but rather in an account at a brokerage firm, bank or other similar organization, then you are the beneficial owner of shares held in “street name” and the Notice is being forwarded to you by that organization. The organization holding your account is considered to be the stockholder of record for purposes of voting at the Annual Meeting. As a beneficial owner, you have the right to direct your broker, bank or other agent regarding how to vote the shares in your account. You are also invited to attend the Annual Meeting. You may vote prior to the Annual Meeting by logging in with the Control Number on your voting instruction form at www.proxyvote.com. You may access the meeting and vote by logging in with your Control Number at www.virtualshareholdermeeting.com/2025.

What am I voting on?

There are four matters scheduled for a vote:

- Proposal 1: To elect the three Class II directors named below to hold office until the Company’s 2028 annual meeting of stockholders.

Nominees:

Percival-Baretto-Ko
Bali Muralidhar, M.D., Ph.D.
Daniel Spiegelman

- Proposal 2: To ratify the selection by the Audit Committee of the Board (the “Audit Committee”) of BDO USA, P.C. as the independent registered public accounting firm of the Company for the Company’s fiscal year ending December 31, 2025;

- Proposal 3: To approve an amendment to the Company's Amended and Restated Certificate of Incorporation to effect a the Reverse Stock Split of the Company's common stock by a ratio of between one-for-five and one-for-thirty, with the exact ratio to be determined by the Board in its sole discretion and with such Reverse Stock Split to be effected at such time and date, if at all, as determined by the Board in its sole discretion; and
- Proposal 4: To approve the adjournment of the Annual Meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal 3.

What if another matter is properly brought before the meeting?

The Board knows of no other matters that will be presented for consideration at the Annual Meeting. If any other matters are properly brought before the Annual Meeting, it is the intention of the persons named in the accompanying proxy to vote on those matters in accordance with their best judgment.

How do I vote?

You may either vote "For" all the nominees to the Board or you may "Withhold" your vote for any nominee you specify. For each of the other matters to be voted on, you may vote "For" or "Against" or abstain from voting.

The procedures for voting are fairly simple:

Stockholder of Record: Shares Registered in Your Name

If you are a stockholder of record, you may vote using the following mechanisms:

- To vote using the proxy card, simply complete, sign and date the proxy card that may be delivered and return it promptly in the envelope provided. If you return your signed proxy card to us before the Annual Meeting, we will vote your shares as you direct.
- To vote over the telephone, dial toll-free 1-800-690-6903 using a touch-tone phone and follow the recorded instructions. You will be asked to provide the company number and control number from the Notice. Your telephone vote must be received by 11:59 p.m. (Eastern Time) on June 8, 2025 to be counted.
- To vote through the internet, go to www.proxyvote.com to complete an electronic proxy card. You will be asked to provide the company number and control number from the Notice. Your internet vote must be received by 11:59 p.m. (Eastern Time) on June 8, 2025 to be counted.

Beneficial Owner: Shares Registered in the Name of Broker or Bank

If you are a beneficial owner of shares registered in the name of your broker, bank or other agent, you should have received a Notice containing voting instructions from that organization rather than from the Company. Simply follow the voting instructions in the Notice to ensure that your vote is counted.

Internet proxy voting may be provided to allow you to vote your shares online, with procedures designed to ensure the authenticity and correctness of your proxy vote instructions. However, please be aware that you must bear any costs associated with your internet access.

How many votes do I have?

On each matter to be voted upon, you have one vote for each share of common stock you own as of the Record Date.

If I am a stockholder of record and I do not vote, or if I return a proxy card or otherwise vote without giving specific voting instructions, what happens?

If you are a stockholder of record and do not vote by completing your proxy card, by telephone, through the internet or online at the Annual Meeting, your shares will not be voted.

If you return a signed and dated proxy card or otherwise vote without marking voting selections, your shares will be voted, as applicable, “For” the election of both nominees for director, “For” the ratification of the selection by the Audit Committee of BDO USA, P.C. as the independent registered public accounting firm of the Company for the fiscal year ending December 31, 2025, “For” the approval of the Reverse Stock Split Proposal, and “For” the Adjournment Proposal. If any other matter is properly presented at the Annual Meeting, your proxy holder (one of the individuals named on your proxy card) will vote your shares using his or her best judgment.

If I am a beneficial owner of shares held in street name and I do not provide my broker or bank with voting instructions, what happens?

If you are a beneficial owner of shares held in street name and you do not instruct your broker, bank or other agent how to vote your shares, your broker, bank or other agent may still be able to vote your shares in its discretion. In this regard, under the rules of the New York Stock Exchange (“NYSE”), brokers, banks and other securities intermediaries that are subject to NYSE rules may use their discretion to vote your “uninstructed” shares with respect to matters considered to be “routine” under NYSE rules, but not with respect to “non-routine” matters. Although our shares are not listed with NYSE, NYSE regulates broker-dealers and their discretion to vote on stockholder proposals. In this regard, Proposal 1 is considered to be “non-routine” under NYSE rules, meaning that your broker may not vote your shares on Proposal 1 in the absence of your voting instructions. However, Proposals 2, 3 and 4 are considered to be “routine” matters under NYSE rules, meaning that if you do not return voting instructions to your broker by its deadline, your shares may be voted by your broker in its discretion on Proposal 2, Proposal 3 and Proposal 4.

If you are a beneficial owner of shares held in street name, in order to ensure your shares are voted in the way you would prefer, you must provide voting instructions to your broker, bank or other agent by the deadline provided in the materials you receive from your broker, bank or other agent.

Who is paying for this proxy solicitation?

We will pay for the entire cost of soliciting proxies. In addition to these proxy materials, our directors and employees may also solicit proxies in person, by telephone, or by other means of communication. Directors and employees will not be paid any additional compensation for soliciting proxies. We may also reimburse brokerage firms, banks and other agents for the cost of forwarding proxy materials to beneficial owners.

What does it mean if I receive more than one Notice?

If you receive more than one Notice, your shares may be registered in more than one name or in different accounts. Please follow the voting instructions on the Notices to ensure that all of your shares are voted.

Can I change my vote after submitting my proxy?

Stockholder of Record: Shares Registered in Your Name.

Yes. You can revoke your proxy at any time before the final vote at the Annual Meeting. If you are the record holder of your shares, you may revoke your proxy in any one of the following ways:

- You may submit another properly completed proxy card with a later date.
- You may grant a subsequent proxy through the internet.

- You may virtually attend the Annual Meeting and vote online. Simply attending the Annual Meeting will not, by itself, revoke your proxy.

Your most current proxy card or telephone or internet proxy is the one that is counted.

Beneficial Owner: Shares Registered in the Name of Broker or Bank.

If your shares are held by your broker, bank or other agent, you should follow the instructions provided by your broker, bank or other agent.

Will a list of record stockholders as of the record date be available?

For the ten days ending the day prior to the Annual Meeting, a list of our record stockholders as of the close of business on the Record Date will be available for examination by any stockholder of record for a legally valid purpose at our corporate headquarters during regular business hours. To access the list of record stockholders beginning May 19, 2025 and until the meeting, stockholders should email investors@sprucebio.com.

When are stockholder proposals and director nominations due for next year's annual meeting?

To be considered for inclusion in next year's proxy materials, your proposal must be submitted in writing by December 16, 2025, to 611 Gateway Boulevard, Suite 740, South San Francisco, California 94080, Attention: Corporate Secretary. If you wish to submit a proposal (including a director nomination) at the meeting that is not to be included in next year's proxy materials, you must do so between February 9, 2026 and March 11, 2026. In addition, stockholders who intend to solicit proxies in support of director nominees other than the Company's nominees must also comply with the additional requirements of Rule 14a-19(b). You are also advised to review the Company's amended and restated bylaws, which contain additional requirements relating to advance notice of stockholder proposals and director nominations. The timely submission of a proposal (including a director nomination) does not guarantee its inclusion in the Company's proxy materials.

Who will count the votes?

Votes will be counted by the inspector of election appointed for the Annual Meeting.

What are "broker non-votes"?

As discussed above, when a beneficial owner of shares held in street name does not give voting instructions to his or her broker, bank or other securities intermediary holding his or her shares as to how to vote on matters deemed to be "non-routine" under NYSE rules, the broker, bank or other such agent cannot vote the shares. When there is at least one "routine" matter that the broker, bank or other securities intermediary votes on, the shares that are un-voted on "non-routine" matters are counted as "broker non-votes." Proposal 1 is considered to be "non-routine" under NYSE rules and we therefore expect broker non-votes to exist in connection with this proposal. Proposal 2 and Proposal 3 are "routine" matters and therefore we expect brokers, banks or other securities intermediaries to vote on these proposals.

As a reminder, if you are a beneficial owner of shares held in street name, in order to ensure your shares are voted in the way you would prefer, you must provide voting instructions to your broker, bank or other agent by the deadline provided in the materials you receive from your broker, bank or other agent.

How many votes are needed to adopt or approve each proposal and how will votes be counted?

The following table summarizes the minimum vote needed to approve each proposal and the effect of abstentions and broker non-votes.

Proposal Number	Proposal Description	Vote Required for Approval	Voting Options	Effect of Abstentions or Withhold Votes, as applicable	Effect of Broker Non-Votes
1	Director Election Proposal	Directors shall be elected by a plurality of the votes of the shares present in person, by remote communication, if applicable, or represented by proxy at the meeting and entitled to vote generally on the election of director.	FOR or WITHHOLD with respect to each of the two director nominees	No effect	No effect
2	Auditor Ratification Proposal	Affirmative vote of the majority of shares present in person, by remote communication, if applicable, or represented by proxy at the meeting and entitled to vote generally on the subject matter shall be the act of the stockholders.	FOR, AGAINST, or ABSTAIN	Against	Not applicable ⁽¹⁾
3	Reverse Stock Split Proposal	Affirmative vote of the majority of shares present in person, by remote communication, if applicable, or represented by proxy at the meeting and entitled to vote generally on the subject matter shall be the act of the stockholders.	FOR, AGAINST, or ABSTAIN	Against	Not applicable ⁽¹⁾
4	Adjournment Proposal	Affirmative vote of the majority of shares present in person, by remote communication, if applicable, or represented by proxy at the meeting and entitled to vote generally on the subject matter shall be the act of the stockholders.	FOR, AGAINST, or ABSTAIN	Against	Not applicable ⁽¹⁾

⁽¹⁾ NYSE has advised us that this proposal should be considered a “routine” matter under NYSE rules. Although our shares are not listed with the NYSE, the NYSE regulates broker-dealers and their discretion to vote on stockholder proposals. Accordingly, if you hold your shares in street name and do not provide voting instructions to your broker that holds your shares, we believe your broker should have discretionary authority under NYSE rules to vote your shares on this proposal absent additional instructions from you. Given such discretionary authority, we do not anticipate broker non-votes for this proposal.

What is the quorum requirement?

A quorum of stockholders is necessary to hold a valid meeting. A quorum will be present if stockholders holding at least a majority of the outstanding shares of stock entitled to vote are present at the Annual Meeting virtually or represented by proxy. On the Record Date, there were 42,231,285 shares outstanding and entitled to vote. Thus, the holders of 21,115,643 shares must be present virtually or represented by proxy at the Annual Meeting to have a quorum.

Your shares will be counted towards the quorum only if you submit a valid proxy (or one is submitted on your behalf by your broker, bank or other nominee) or if you vote online at the Annual Meeting. Abstentions, withhold

votes and broker non-votes will be counted towards the quorum requirement. If there is no quorum, the chairman of the Annual Meeting or the holders of a majority of shares present at the Annual Meeting or represented by proxy may adjourn the meeting to another date.

How can I find out the results of the voting at the Annual Meeting?

Preliminary voting results will be announced at the Annual Meeting. In addition, final voting results will be published in a current report on Form 8-K that we expect to file within four business days after the Annual Meeting. If final voting results are not available to us in time to file a Form 8-K within four business days after the Annual Meeting, we intend to file a Form 8-K to publish preliminary results and, within four business days after the final results are known to us, file an additional Form 8-K to publish the final results.

Proposal 1
Election of Directors

The Board is divided into three classes. Each class consists, as nearly as possible, of one-third of the total number of directors, and each class has a three-year term. Vacancies on the Board may be filled by persons elected by a majority of the remaining directors. A director elected by the Board to fill a vacancy in a class, including vacancies created by an increase in the number of directors, shall serve for the remainder of the full term of that class and until the director's successor is duly elected and qualified.

The Board presently has eight members. There are three directors in the class whose term of office expires in 2025: Percival Barretto-Ko, Bali Muralidhar, M.D, Ph.D. and Daniel Spiegelman. Each is currently a director of the Company. If elected at the Annual Meeting, each of Mr. Barretto-Ko, Dr. Muralidhar and Mr. Spiegelman would serve until the Company's 2028 annual meeting of stockholders and until the director's successor has been duly elected and qualified, or, if sooner, until the director's death, resignation or removal.

Dr. Muralidhar and Mr. Spiegelman were each previously elected by stockholders at the Company's 2022 annual meeting of stockholders. Mr. Barretto-Ko was recommended as a director by the Nominating and Corporate Governance Committee ("Nominating Committee").

It is the Company's policy to invite directors and nominees for director to attend the Annual Meeting, including virtually if applicable. All of the directors attended the 2024 Annual Meeting of Stockholders.

Directors are elected at the Annual Meeting by a plurality of the votes of the holders of shares present virtually or represented by proxy and entitled to vote on the election of directors. Accordingly, the three nominees receiving the highest number of affirmative votes will be elected. Each person nominated for election has agreed to serve if elected. The Company's management has no reason to believe that any nominee will be unable to serve.

The Nominating Committee seeks to assemble a board that, as a whole, is diverse and possesses the appropriate balance of professional and industry knowledge, financial expertise and high-level management experience necessary to oversee and direct the Company's business. To that end, the Nominating Committee has identified and evaluated nominees in the broader context of the Board's overall composition, with the goal of recruiting members who complement and strengthen the skills of other members and who also exhibit integrity, collegiality, sound business judgment and other qualities that the Nominating Committee views as critical to effective functioning of the Board. The brief biographies below include information, as of the date of this Proxy Statement, regarding the specific and particular experience, qualifications, attributes or skills of each director or nominee that led the Nominating Committee to believe that that nominee should serve or continue to serve on the Board. However, each of the members of the Nominating Committee may have a variety of reasons why he or she believes a particular person would be an appropriate nominee for the Board, and these views may differ from the views of other members. The following is a brief biography as of the Record Date of each nominee and each director whose term will continue after the Annual Meeting.

Nominees for Election for a Three-year Term Expiring at the Company's 2028 Annual Meeting of Stockholders

Percival Barretto-Ko, 52, has served as a member of the Board since May 2023. Most recently, Mr. Barretto-Ko served as President and Chief Executive Officer at Plexium, Inc., a pharmaceutical company ("Plexium"). Prior to joining Plexium, Mr. Barretto-Ko served in numerous roles, including Chief Business Officer and President U.S., at Astellas Pharma Inc., a pharmaceutical company, from 2005 to 2021. Prior to joining Astellas, Mr. Barretto-Ko served in increasingly senior roles at Roche UK and US, a pharmaceutical company, from 2001 to 2005. Mr. Barretto-Ko has served on the board of directors for Alessa Therapeutics, Inc., a private pharmaceutical company, since January 2022. Mr. Barretto-Ko earned a B.S. in Biological Sciences with Honors from Cornell University and an M.B.A. from Yale University. In addition, Mr. Barretto-Ko served as a Sloan Fellow for Innovation and Global Leadership at the MIT Sloan School of Management, where he was awarded an M.Sc. in Management.

The Board and Nominating Committee believes that Mr. Barretto-Ko's business and managerial experience as well as his extensive experience in the pharmaceutical industry qualifies him to serve on the Board.

Bali Muralidhar, M.D., Ph.D., 45, has served as a member of the Board since February 2020. Dr. Muralidhar has served as a managing partner at Abingworth LLP (“Abingworth”), a leading transatlantic life sciences investment firm, since December 2020, and as a partner from March 2019 to December 2020. Dr. Muralidhar has over 15 years of professional experience in healthcare across a range of functions including venture investing, research and development, clinical practice and teaching. Prior to joining Abingworth, Dr. Muralidhar was a senior partner at MVM Partners LLP (“MVM”), a healthcare investment company, from November 2012 to March 2019. Prior to MVM, he was a member of the leveraged buyout team at Bain Capital LP, a private investment company, focusing on healthcare from April 2011 to November 2012. Dr. Muralidhar represents Abingworth on the boards of several private life sciences and biopharmaceutical companies, including Anjarium Biosciences AG, since August 2021, Ascend Gene and Cell Therapies Limited, since February 2023, Wugen Inc., since July 2021, Cytospire Therapeutics Limited, since May 2023, Advancell Pty Ltd since February 2025, Launch Therapeutics since April 2022 and Pathlys Pharma, Inc., since January 2023. He has served on the boards of NuCana PLC, a life sciences company, since October 2020. He was an executive officer on the joint steering committee of CymaBay Therapeutics, Inc., a biotechnology company until March 2024. Dr. Muralidhar previously served on the board of directors of Wilson Therapeutics, a public biopharmaceutical company, from March 2014 to April 2018, Exicure, Inc., a public biotechnology company, from August 2019 to December 2022, Reneo Pharmaceuticals, Inc., a public biopharmaceutical company, from April 2021 until October 2024 and Valneva SE, a public biotechnology company headquartered in France, from May 2017 to December 2019. Dr. Muralidhar earned a degree in clinical medicine from the University of Oxford and has a Ph.D. in translational cancer research from the MRC Cancer Cell Unit, University of Cambridge.

The Board and Nominating Committee believes that Dr. Muralidhar’s investment experience in the healthcare industry qualifies him to serve on the Board.

Daniel Spiegelman, 66, has served as a member of the Board since September 2020. Mr. Spiegelman currently provides consulting services to various life sciences companies and has served as a Venture Partner at Samsara BioCapital since 2023. From May 2012 to January 2020, Mr. Spiegelman was the Executive Vice President and Chief Financial Officer of BioMarin Pharmaceutical Inc. (“BioMarin”), a biotechnology company. Prior to BioMarin, Mr. Spiegelman served as a consultant to provide strategic financial management support a portfolio of public and private life science companies. From January 1998 to May 2009, Mr. Spiegelman was the Chief Financial Officer of CV Therapeutics, Inc., a biopharmaceutical company. From July 1991 to January 1998, Mr. Spiegelman served in various roles at Genentech, Inc., (now a member of the Roche Group) most recently as Treasurer. Mr. Spiegelman has served as a director of Maze Therapeutics, Inc., a public biologics drug developer, since October 2020, of vTv Therapeutics, Inc., a public biopharmaceutical company, since June 2024 and of Kyverna Therapeutics, Inc., a public pharmaceutical company, since April 2021. Mr. Spiegelman served as a director of Myriad Genetics, Inc. a public molecular diagnostic company, from May 2020 to June 2024 and as a director of Opthea Limited, a public biologics drug developer, from October 2020 to April 2024. Mr. Spiegelman has served as director and chair of Tizona Therapeutics, Inc., a private biopharmaceutical company, since May 2019 and as director of BlueJay Therapeutics, Inc., a private biopharmaceutical company, since October 2024. Mr. Spiegelman received a B.A. from Stanford University and an M.B.A. from the Stanford Graduate School of Business.

The Board and Nominating Committee believes that Mr. Spiegelman’s substantial experience as an executive officer in the pharmaceutical and biotechnology industries, including his financial expertise, qualifies him to serve on the Board.

**The Board Recommends
a Vote in Favor of Each Named Nominee.**

Directors Continuing in Office Until the Company's 2026 Annual Meeting of Stockholders

Javier Szwarcberg, M.D., MPH, 55, has served as our Chief Executive Officer and a member of the Board since January 2022. Dr. Szwarcberg previously served as Group Vice President, Head of Product and Portfolio Development for BioMarin from February 2020 to January 2022. Prior to joining BioMarin, Dr. Szwarcberg served as Senior Vice President, Program and Portfolio Management for Ultragenyx Pharmaceutical Inc., a biotechnology company, from October 2017 to February 2020. From October 2016 to October 2017, Dr. Szwarcberg served as Vice President of Clinical Development and Business Development for Horizon Pharma plc ("Horizon"), a public biopharmaceutical company. Dr. Szwarcberg received an M.D. from the University of Buenos Aires and an MPH from the Harvard T.H. Chan School of Public Health.

The Board and Nominating Committee believes that Dr. Szwarcberg's extensive experience in the biotechnology and pharmaceutical industries qualify him to serve on the Board.

Michael Grey, 72, has served as Executive Chairman of the Board since April 2017 and served as our Interim Chief Executive Officer from November 2021 to January 2022. In addition, Mr. Grey has served as Chairman of Mirum Pharmaceuticals, Inc., a public biopharmaceutical company, since January 2020, and has been a director of Mirum since May 2018. Mr. Grey previously served as Executive Chairman of Mirum from March 2019 to December 2019 and Chief Executive Officer of Mirum from May 2018 to March 2019. Mr. Grey served as Executive Chairman of Reneo Pharmaceuticals, Inc. from December 2017 to October 2024 (merged with OnKure, Inc., a biopharmaceutical company, in 2024) and has served as a director for OnKure since October 2024. Mr. Grey has served as Executive Chairman of Plexium since September 2020. He has served as Chairman of Sorriso Pharmaceuticals, Inc., a private pharmaceutical company since May 2021 and as Executive Chair of Theolytics Ltd., a private biotechnology company, since November 2023. Mr. Grey previously served as a director of BioMarin from December 2005 to May 2021 and as director of Mirati Therapeutics, Inc., a biopharmaceutical company, from November 2014 to June 2021. He has also served as a venture partner at Pappas Ventures, a venture capital firm, since January 2010, as a director of Curzion Pharmaceuticals, Inc., a private biopharmaceutical company, which was acquired in April 2020 by Horizon, from January 2019 to April 2020, and as a director at Horizon from September 2011 to October 2023. Mr. Grey served from January 2019 to September 2019 as President and Chief Executive Officer of Curzion, from October 2015 to January 2017 as President and Chief Executive Officer of Amplyx Pharmaceuticals, Inc., and from September 2014 to December 2017 as Chairman and Chief Executive Officer of Reneo. From February 2011 to June 2014, Mr. Grey served as President and Chief Executive Officer of Lumena Pharmaceuticals, Inc., which was acquired by Shire plc in June 2014. Mr. Grey has more than 45 years of experience in the pharmaceutical and biotechnology industries and has held senior positions at a number of companies, including President and Chief Executive Officer of SGX Pharmaceuticals, Inc. (sold to Eli Lilly and Company in 2008), President and Chief Executive Officer of Trega Biosciences, Inc. (sold to LION Bioscience, Inc. in 2001), and President of BioChem Therapeutic Inc. Prior to these, Mr. Grey served in various roles with Glaxo, Inc., and Glaxo Holdings PLC, culminating in his position as Vice President, Corporate Development and director of international licensing. Mr. Grey received a B.S. in chemistry from the University of Nottingham in the United Kingdom.

The Board and Nominating Committee believes that Mr. Grey's extensive experience managing and leading both early stage and established companies within the pharmaceutical and biotechnology industries qualify him to serve on the Board.

Camilla V. Simpson, M.Sc., 53, has served as a member of the Board since October 2017. Since April 2021, Ms. Simpson has served as Chief Executive Officer of Zehna Therapeutics, Inc., a private biotechnology company and spin-out from the Cleveland Clinic. Since April 2019, Ms. Simpson has been the Managing Member and President of Rare Strategic, LLC where she provides strategic advice and consulting services to biotechnology companies. Ms. Simpson joined the board of directors of Dyve Biosciences, Inc., a private biopharmaceutical company, in December 2020 and the board of directors of GRI Bio, Inc., a public biopharmaceutical company, in April 2023. From April 2017 to April 2019, Ms. Simpson was SVP, Head of Product Portfolio Development at BioMarin, where she was responsible for corporate and R&D governance, program leadership, project management, competitive intelligence, portfolio strategy, and business analytics. From October 2014 to April 2017, Ms. Simpson was Group Vice President Global Regulatory Affairs at BioMarin, and from March 2014 to October 2014, Ms. Simpson was Vice President Regulatory Affairs EU at BioMarin. She also spent 12 years at Shire, where after multiple roles of increasing responsibility, she held the position of Vice President Regulatory Affairs Early Development and Business

Development. Ms. Simpson holds a B.Sc. from University College Galway, Ireland, a B.Sc. Hons. from Kingston University, United Kingdom, and an M.Sc. with distinction from the University of London, United Kingdom.

The Board and Nominating Committee believes that Ms. Simpson's significant experience as a senior executive in the pharmaceutical and biotechnology industries, including her experience in a wide range of drug development, organizational strategy and global regulatory affairs matters, qualifies her to serve on the Board.

Directors Continuing in Office Until the Company's 2027 Annual Meeting of Stockholders

Tiba Aynechi, Ph.D., 49, has served as a member of the Board since May 2016. Since December 2021, Dr. Aynechi has been a General Partner at Norwest Venture Partners ("Norwest"), a private investment company. Prior to Norwest, Dr. Aynechi was a senior partner at Novo Ventures (US) Inc. ("Novo Ventures"), which provides certain consultancy services to Novo Holdings A/S ("Novo"), a Danish limited liability company that manages investments and financial assets. Prior to joining Novo Ventures in March 2010, Dr. Aynechi was employed from June 2006 to March 2010 by Burrill & Company, a financial firm specializing in biotechnology and life sciences investment, in various positions, including from January 2009 to March 2010 as a director in merchant banking where she was responsible for regional and cross-border mergers and acquisitions, licensing, and financing transactions. Dr. Aynechi served as a director of Nkarta, Inc., a public biopharmaceutical company, from October 2015 to August 2022, as a director of Aristeia Therapeutics, Inc., a private biopharmaceutical company, from August 2018 to December 2021, MDLIVE, a private telehealth company, from July 2018 to May 2021, Arcellex, Inc, a then-private biotechnology company, from July 2015 to November 2021, and as a director of Mirum from November 2018 to August 2021. She currently serves as a member of the board of directors of several private biotechnology and medical device companies, including Avalyn Pharma Inc. ("Avalyn"), since April 2017, Engrail Therapeutics, Inc., since May 2024, Nuvig Therapeutics, Inc., since December 2024, Rezo Therapeutics, Inc., since July 2022 and Ray Therapeutics, Inc., since May 2023. She has served on the board of directors of MBX Biosciences, Inc, a biopharmaceutical company, since December 2022. Dr. Aynechi received her Ph.D. in biophysics from the University of California, San Francisco, where her research involved developing computational methods for drug discovery. She received her B.S. in physics from the University of California, Irvine.

The Board and Nominating Committee believes that Dr. Aynechi's extensive experience in the biotechnology and pharmaceutical industries, including her expertise in handling a wide range of financing transactions, qualifies her to serve on the Board.

Kirk Ways, M.D., Ph.D., 73, has served on the Board since June 2021 and as interim Chief Medical officer since December 2024. Dr. Ways has served as interim Chief Medical Officer of MBX from November 2023 to July 2024. From October 2018 to January 2021, Dr. Ways served as Chief Medical Officer of Nuvelution Pharma, Inc. ("Nuvelution"), a biopharmaceutical company. Prior to joining Nuvelution, Dr. Ways served as Development Head of Cardiovascular and Metabolism at Janssen Pharmaceuticals, Inc. ("Janssen"), a biopharmaceutical company. Prior to joining Janssen, Dr. Ways served in leadership capacities at several life sciences companies, including BioStratum Incorporated as Vice President and Chief Development Officer, Aventis, Inc. as Senior Global Medical Leader and Project Team Leader and Lilly Research Laboratories as a Research Fellow with responsibilities for the preclinical and clinical development for agents treating the chronic complications of diabetes. Prior to joining the pharmaceutical industry, Dr. Ways served as Director of the Diabetes Center, Vice Chairman for the Department of Internal Medicine, Endocrinology Section Head and Professor of Medicine at East Carolina School of Medicine. Dr. Ways has authored more than one hundred publications in the fields of diabetes and cancer. Dr. Ways earned his M.D. with honors and a Ph.D. in Pharmacology from the University of North Carolina and graduated with a B.A. magna cum laude from Bridgewater College.

The Board and Nominating Committee believes that Dr. Ways' significant experience in leadership roles with pharmaceutical and biotechnology companies qualifies him to serve on the Board.

INFORMATION REGARDING THE BOARD OF DIRECTORS AND CORPORATE GOVERNANCE

Independence of the Board of Directors

As required under the Nasdaq Stock Market (“Nasdaq”) listing rules, a majority of the members of a listed company’s board of directors must qualify as “independent,” as affirmatively determined by the board of directors. The Board consults with the Company’s counsel to ensure that the Board’s determinations are consistent with relevant securities and other laws and regulations regarding the definition of “independent,” including those set forth in the Nasdaq listing rules, as in effect from time to time.

Consistent with these considerations, after review of all relevant identified transactions or relationships between each director, or any of his or her family members, and the Company, its senior management and its independent auditors, the Board has affirmatively determined that all of the directors who served on our board in 2024, except for Dr. Szwarcberg, Dr. Ways and Mr. Grey, are independent directors within the meaning of the applicable Nasdaq listing rules. Prior to his service as Interim Chief Medical Officer, Dr. Ways was determined to be independent during his time on the Board. In making this determination, the Board found that none of these directors or nominees for director had a material or other disqualifying relationship with the Company.

Board Leadership Structure

The Board is currently chaired by Mr. Grey, who has authority, among other things, to call and preside over Board meetings, to set meeting agendas and to determine materials to be distributed to the Board. Accordingly, the Chair of the Board has substantial ability to shape the work of the Board. The Company believes that separation of the positions of Chair of the Board and Chief Executive Officer reinforces the independence of the Board in its oversight of the business and affairs of the Company. In addition, the Company believes that having an independent Chair of the Board creates an environment that is more conducive to the Board’s objective evaluation and oversight of management’s performance, increasing management accountability, and improving the ability of the Board to monitor whether management’s actions are in the best interests of the Company and its stockholders, including with respect to evaluating whether steps management is taking to manage risks are appropriate for the Company. Mr. Grey’s responsibility is to ensure that our Board functions properly and to work with our Chief Executive Officer to set the Board’s agenda. We expect him to facilitate communications among our directors and between the Board and senior management. While Mr. Grey provides independent leadership, he also works closely with our Chief Executive Officer to ensure that our directors receive the information that they need to perform their responsibilities, including discussing and providing critical review of the matters that come before the Board and assessing management’s performance. As a result, we believe that such separation can enhance the effectiveness of our Board as a whole. That said, the Company does not believe there should be a fixed rule regarding the positions of Chief Executive Officer and Chair of the Board being held by different individuals, or whether the Chair of the Board should be elected from among the non-employee directors. The needs of the Company and the individuals available to assume these roles may require different outcomes at different times, and the Board believes that retaining flexibility in these decisions is in the best interests of the Company.

In addition, the Company has a separate Chair for each committee of the Board. The Chair of each committee reports periodically to the Board on the activities of their committee in fulfilling their responsibilities as detailed in their respective charters.

Role of the Board in Risk Oversight

One of the Board’s key functions is informed oversight of the Company’s risk management process. The Board does not have a standing risk management committee, but rather administers this oversight function directly through the Board as a whole, as well as through various Board standing committees that address risks inherent in their respective areas of oversight. In particular, the Board is responsible for monitoring and assessing strategic risk exposure, such as cybersecurity-related risks, including a determination of the nature and level of risk appropriate for the Company. The Audit Committee has the responsibility to consider and discuss our major risk exposures and the steps our management has taken to monitor and control these exposures, including guidelines and policies to govern the process by which risk assessment and management is undertaken, and to provide oversight assistance in connection with our strategic, financial, operational, information security and data privacy (including cybersecurity), regulatory,

and other risks related to the Company's business, including compliance programs as established by management and the Board. The Company's assessment and management of material risks from cybersecurity threats are integrated into the Company's overall risk management processes. For example, cybersecurity risk is addressed as a component of the Company's enterprise risk management program, which is evaluated periodically by the Company's Chief Compliance Officer, which together with the Audit Committee, evaluates material risks from cybersecurity threats against the Company's overall business objectives and reports to the Board. The Nominating Committee monitors the effectiveness of our corporate governance guidelines. The Compensation Committee of the Board (the "Compensation Committee") assesses and monitors whether any of our compensation policies and practices has the potential to encourage excessive risk-taking. Typically, the entire Board meets with the personnel in charge of the Company's risk management efforts at least annually, and the applicable Board committees meet at least annually with the personnel responsible for risk management efforts in the committees' respective areas of oversight. Both the Board as a whole and the various standing committees receive periodic reports from the head of risk management, as well as incidental reports as matters may arise. It is the responsibility of the committee Chairs to report findings regarding material risk exposures to the Board as quickly as possible.

Role of the Board in Strategy Oversight

Our Board is deeply engaged and involved in overseeing our long-range strategy. Our Board's oversight of risk is another integral component of the Board's oversight and engagement on strategic matters. Strategy-related matters are regularly discussed at board meetings and, when relevant, at Committee meetings. We also dedicate at least one board meeting every year to an even more intensive review and discussion of our strategic plan. Matters of strategy also inform committee-level discussions of many issues, including enterprise risk. Engagement of the Board on these issues and other matters of strategic importance continues in between meetings, including through updates to the Board on significant items and discussions between the CEO and our Chair of the Board on a periodic basis. Each director is expected to and does bring to bear their own talents, insights, and experiences to these strategy discussions.

Meetings of the Board of Directors

The Board met eleven times during the last fiscal year. All directors, except Dr. Muralidhar, attended at least 75% of the aggregate number of meetings of the Board and of the committees on which they served, held during the portion of the last fiscal year for which they were directors or committee members, respectively.

In 2024, the Company's non-employee directors met four times in regularly scheduled executive sessions at which only non-employee directors were present.

Board Composition

We believe that our directors collectively have an appropriate balance of knowledge, experience, attributes, skills and expertise to ensure that the Board appropriately fulfills its oversight responsibilities and acts in the best interests of our stockholders. Although specific qualifications for membership on the Board may vary from time to time, desired qualities include (A) the highest personal integrity and ethics, (B) relevant expertise upon which to be able to offer advice and guidance to management, (C) demonstrated excellence in his or her field, (D) sound business judgment, (E) sufficient time to devote to the affairs of the Company, and (F) commitment to rigorously represent the long-term interests of our stockholders.

The following table depicts the key skills and experience that we consider important in light of our current business structure and that our directors bring to our company.

	T. Aynechi	P. Barretto-Ko	M. Grey	B. Muralidhar	C. Simpson	D. Spiegelman	J. Szwarcberg	K. Ways
Financial and Accounting			•	•		•		
Senior Leadership	•	•	•	•	•	•	•	•
Healthcare	•	•	•	•	•	•	•	•
Research and Development	•	•	•		•		•	•
Commercial		•	•					
Governance	•		•	•		•		
Global Business	•	•	•	•	•	•	•	•
Public Policy and Regulatory		•			•		•	•

1. Financial and Accounting: knowledge of the financial markets, corporate finance, accounting regulations, and accounting and financial reporting processes;
2. Senior Leadership Experience: serving in a senior leadership role at another organization and experience with human capital management;
3. Healthcare: experience in or with the biotechnology, life sciences and/or pharmaceutical industries, including experience in the clinical development of pharmaceutical products;
4. Research and Development: experience in the research and development of therapeutic investigational products, including those within endocrine and/or rare diseases;
5. Commercialization: experience executing corporate commercial and/or marketing strategies and initiatives;
6. Governance: experience serving on the board of directors of other public companies, and knowledge regarding public company governance and compensation, policies and practices
7. Global Business: experience outside of the United States, including knowledge of and experience with research and development and commercial operations; and
8. Public Policy and Regulatory: experience with government, public policy or regulatory affairs.

Information Regarding Committees of the Board of Directors

The Board has three committees: the Audit Committee, Compensation Committee and Nominating Committee. The following table provides membership and meeting information for 2024 for each of the Board committees:

Name	Audit	Compensation	Nominating and Corporate Governance
Javier Szwarcberg, M.D., MPH			
Michael Grey			
Tiba Aynechi, Ph.D.		X*	
Percival Barretto-Ko	X		
Bali Muralidhar, M.D., Ph.D.		X	
Niall O'Donnell, Ph.D. ⁽¹⁾	X		
Camilla V. Simpson, M.Sc. ⁽²⁾	X	X	X*
Daniel Spiegelman	X*		X
Kirk Ways, M.D., Ph.D. ⁽³⁾			X*
Total meetings in 2024	5	2	3

* Committee Chairperson

- (1) Dr. O'Donnell served on our Board and was a member of the Audit Committee until his resignation on May 22, 2024.
- (2) Ms. Simpson became a member of the Audit Committee effective May 22, 2024 and became Chairperson of the Nominating Committee on March 26, 2025
- (3) Dr. Ways was the Chairperson of the Nominating Committee until March 26, 2025. Ms. Simpson was appointed Chairperson as of such date.

Each of the committees has authority to engage legal counsel or other experts or consultants, as it deems appropriate to carry out its responsibilities. The Board has determined that each member of each committee meets the applicable Nasdaq rules and regulations regarding "independence" and each member is free of any relationship that would impair his or her individual exercise of independent judgment with regard to the Company.

Below is a description of each committee of the Board.

Audit Committee

The Audit Committee was established by the Board in accordance with Section 3(a)(58)(A) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), to oversee the Company's corporate accounting and financial reporting processes and audits of its financial statements. The primary purpose of the Audit Committee is to discharge the responsibilities of the Board with respect to our corporate accounting and financial reporting processes, systems of internal control and financial-statement audits, and to oversee our independent registered accounting firm.

Specific responsibilities of the Audit Committee include:

- overseeing our corporate accounting and financial reporting processes;
- managing the selection, engagement, qualifications, independence, and performance of a qualified firm to serve as the independent registered public accounting firm to audit our financial statements;
- discussing the scope and results of the audit with the independent registered public accounting firm, and reviewing, with management and the independent accountants, our interim and year-end operating results;
- developing procedures for employees to submit concerns anonymously about questionable accounting or audit matters;
- reviewing related person transactions;
- reporting to the Board with respect to material issues that arise regarding the quality or integrity of our financial statements, our compliance with applicable legal or regulatory requirements and other matters; and
- approving, or, as permitted, pre-approving, audit and permissible non-audit services to be performed by the independent registered public accounting firm.

The Audit Committee is composed of three directors: Mr. Spiegelman, Mr. Barretto-Ko, and Ms. Simpson. Ms. Simpson succeeded Dr. O'Donnell, who served on the Audit Committee until his resignation from the Board on May 22, 2024. The Audit Committee met five times during the fiscal year. The Board has adopted a written Audit Committee charter that is available to stockholders on the Company's website at www.sprucebio.com. The information on our website is not incorporated by reference into this Proxy Statement or our Annual Report on Form 10-K for the fiscal year ended December 31, 2024 (the "Annual Report").

The Board reviews the Nasdaq listing rules definition of independence for Audit Committee members on an annual basis and has determined that all members of the Audit Committee are independent (as independence is currently defined in Rule 5605(c)(2)(A)(i) and (ii) of the Nasdaq listing rules).

The Board has also determined that Mr. Spiegelman qualifies as an “audit committee financial expert,” as defined in applicable SEC rules. In making this determination, the Board made a qualitative assessment of Mr. Spiegelman’s level of knowledge and experience based on a number of factors, including his formal education and experience as a chief financial officer.

Report of the Audit Committee of the Board*

The Audit Committee has reviewed and discussed the audited financial statements for the fiscal year ended December 31, 2024 with management of the Company. The Audit Committee has discussed with the independent registered public accounting firm the matters required to be discussed by the applicable requirements of the Public Company Accounting Oversight Board (“PCAOB”) and the SEC. The Audit Committee has also received the written disclosures and the letter from the independent registered public accounting firm required by applicable requirements of the PCAOB regarding the independent accountants’ communications with the Audit Committee concerning independence, and has discussed with the independent registered public accounting firm the accounting firm’s independence. Based on the foregoing, the Audit Committee has recommended to the Board that the audited financial statements be included in the Annual Report.

Daniel Spiegelman
Percival Barretto-Ko
Camilla V. Simpson, M.Sc.

* *The material in this report is not “soliciting material,” is not deemed “filed” with the SEC and is not to be incorporated by reference in any filing of the Company under the Securities Act of 1933, as amended (the “Securities Act”) or the Exchange Act, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.*

Compensation Committee

The Compensation Committee is composed of three directors: Dr. Aynechi, Dr. Muralidhar, and Ms. Simpson. All members of the Compensation Committee are independent (as independence is currently defined in Rule 5605(d)(2) of the Nasdaq listing rules). The Compensation Committee met two times during the fiscal year. The Board has adopted a written Compensation Committee charter that is available to stockholders on the Company’s website at www.sprucebio.com. The information on our website is not incorporated by reference into this Proxy Statement or our Annual Report.

The primary purpose of the Compensation Committee is to discharge the responsibilities of the Board in overseeing our compensation policies, plans, and programs and to review and determine the compensation to be paid to our executive officers, directors, and other senior management, as appropriate.

Specific responsibilities of the Compensation Committee include:

- reviewing and approving the compensation of our Chief Executive Officer, other executive officers and senior management;
- reviewing and approving the compensation paid to our directors;
- reviewing and approving the compensation arrangements with our executive officers and other senior management;
- administering our equity incentive plans and other benefit programs;
- reviewing, adopting, amending, and terminating the terms of any employment agreements, stock option plans, stock appreciation rights plans, severance arrangements, pension and profit sharing plans, incentive plans, stock bonus plans, stock purchase plans, bonus plans, deferred compensation plans,

change-of-control protections, and any other compensatory arrangements for our executive officers and other senior management;

- reviewing, evaluating and recommending to the Board succession plans for our executive officers; and
- reviewing and establishing general policies relating to compensation and benefits of our employees, including our overall compensation philosophy.

Compensation Committee Processes and Procedures

Typically, the Compensation Committee meets quarterly or as needed. The Compensation Committee meets regularly in executive session. However, from time to time, various members of management and other employees as well as outside advisors or consultants may be invited by the Compensation Committee to make presentations, to provide financial or other background information or advice or to otherwise participate in Compensation Committee meetings. Our Chief Executive Officer may not participate in, or be present during, any deliberations or determinations of the Compensation Committee regarding his compensation or individual performance objectives. The charter of the Compensation Committee grants the Compensation Committee full access to all books, records, facilities and personnel of the Company. In addition, under the charter, the Compensation Committee has the authority to obtain, at the expense of the Company, advice and assistance from compensation consultants and internal and external legal, accounting or other advisors and other external resources that the Compensation Committee considers necessary or appropriate in the performance of its duties. The Compensation Committee has direct responsibility for the oversight of the work of any consultants or advisers engaged for the purpose of advising the Committee. In particular, the Compensation Committee has the sole authority to retain, in its sole discretion, compensation consultants to assist in its evaluation of executive and director compensation. In addition, under the charter, the Compensation Committee may select, or receive advice from, a compensation consultant, legal counsel or other adviser to the compensation committee, other than in-house legal counsel and certain other types of advisers, only after taking into consideration six factors, prescribed by the SEC and Nasdaq that bear upon the adviser's independence; however, there is no requirement that any adviser be independent.

In fiscal year 2023, after taking into consideration the six factors prescribed by the SEC and Nasdaq described above, the Compensation Committee engaged Aon Consulting, Inc. ("Aon") as compensation consultant. As part of its engagement, Aon was requested by the Compensation Committee to develop a comparative group of companies and to perform analyses of competitive performance and compensation levels for that group for purposes of developing recommendations on the amount and form of executive and director compensation that were presented to the Compensation Committee for its consideration. The Compensation Committee did not engage Aon for any consulting services in 2024. In addition, management of the Company engaged affiliates of Aon for other services in 2024 that were not related to Aon's Compensation Committee consulting services. Specifically, we engaged an affiliate of Aon for insurance brokerage services, for which we paid \$150,000 in 2024. Although the Compensation Committee was aware of the nature of these additional services, the committee did not review and approve such services, insurance premiums or policies, as those were reviewed and approved by management in the ordinary course of business.

Aon maintains certain policies and practices to protect the independence of the executive compensation consultants engaged by the Compensation Committee. In particular, Aon provides a report to the Compensation Committee on the financial relationship between Aon and the Company, and provides written assurances that, within Aon, the compensation of the affiliate consultants who perform executive compensation services for the Compensation Committee is determined separately from Aon's other lines of business and from the other services it provides to the Company. These safeguards were designed to help ensure that the Compensation Committee's compensation consultants continued to fulfill their role in providing independent, objective advice.

Under its charter, the Compensation Committee may form, and delegate authority to, subcommittees as appropriate. The Board previously formed an Equity Award Committee (the "Equity Award Committee"), currently composed solely of our Chief Executive Officer, to which it delegated authority to grant, without any further action required by the Board or the Compensation Committee, stock options and restricted stock units to employees who are not executives of the Company, in each case pursuant to the 2020 Equity Incentive Plan (the "2020 Plan"). The purpose of this delegation of authority is to enhance the flexibility of equity award administration within the Company and to

facilitate the timely grant of equity awards to non-executive employees, particularly new employees, within specified limits approved by the Board. During fiscal 2024, the Equity Award Committee exercised its authority to grant an aggregate of 300,000 restricted stock units with both performance-based and time-based vesting conditions to non-executive employees.

Typically, the Compensation Committee makes most of the significant adjustments to annual compensation, determines bonus and equity awards and establishes new performance objectives at one or more meetings held during the first quarter of the year. However, the Compensation Committee also considers matters related to individual compensation, such as compensation for new executive hires, as well as high-level strategic issues, such as the efficacy of the Company's compensation strategy, potential modifications to that strategy and new trends, plans or approaches to compensation, at various meetings throughout the year. Generally, the Compensation Committee's process comprises two related elements: the determination of compensation levels and the establishment of performance objectives for the current year. For executives other than our Chief Executive Officer, the Compensation Committee solicits and considers evaluations and recommendations submitted to the Compensation Committee by our Chief Executive Officer.

In the case of our Chief Executive Officer, the evaluation of his performance is conducted by the Compensation Committee, which determines any adjustments to his compensation as well as awards to be granted. For all executives and directors as part of its deliberations, the Compensation Committee may review and consider, as appropriate, materials such as financial reports and projections, operational data, tax and accounting information, tally sheets that set forth the total compensation that may become payable to executives in various hypothetical scenarios, executive and director stock ownership information, company stock performance data, analyses of historical executive compensation levels and current Company-wide compensation levels and recommendations of the Compensation Committee's compensation consultant, including analyses of executive and director compensation paid at other companies identified by the consultant.

Nominating and Corporate Governance Committee

The Nominating Committee is responsible for identifying, reviewing and evaluating candidates to serve as directors of the Company, reviewing and evaluating incumbent directors, recommending to the Board for selecting candidates for election to the Board, making recommendations to the Board regarding the membership of the committees of the Board, assessing the performance of the Board, and developing and making recommendations regarding corporate governance matters.

Specific responsibilities of the Nominating Committee include:

- identifying and evaluating candidates, including the nomination of incumbent directors for reelection and nominees recommended by stockholders, to serve on the Board;
- considering and making recommendations to the Board regarding the composition and chairmanship of the committees of the Board;
- instituting plans or programs for the continuing education of the Board and orientation of new directors;
- developing and making recommendations to the Board regarding corporate governance guidelines and matters; and
- overseeing periodic evaluations of the Board's performance, including committees of the Board and management.

The Nominating Committee is currently composed of two directors: Ms. Simpson and Mr. Spiegelman. Dr. Ways also served on the Nominating Committee until March 26, 2025. All members of the Nominating Committee are independent (as independence is currently defined in Rule 5605(a)(2) of the Nasdaq listing rules). The Nominating Committee met three times during 2024. The Board has adopted a written Nominating Committee charter that is available to stockholders on the Company's website at www.sprucebio.com. The information on our website is not

incorporated by reference into this Proxy Statement or our Annual Report.

The Nominating Committee believes that candidates for director should have certain minimum qualifications, including the ability to read and understand basic financial statements, being over 21 years of age and having the highest personal integrity and ethics. The Nominating Committee also intends to consider such factors as possessing relevant expertise upon which to be able to offer advice and guidance to management, having sufficient time to devote to the affairs of the Company, demonstrated excellence in his or her field, having the ability to exercise sound business judgment and having the commitment to rigorously represent the long-term interests of the Company's stockholders. However, the Nominating Committee retains the right to modify these qualifications from time to time. Candidates for director nominees are reviewed in the context of the current composition of the Board, the operating requirements of the Company and the long-term interests of stockholders. In conducting this assessment, the Nominating Committee typically considers diversity (including gender, racial and ethnic diversity), age, skills and such other factors as it deems appropriate, given the current needs of the Board, to maintain a balance of knowledge, experience and capability.

The Nominating Committee appreciates the value of thoughtful Board refreshment, and seeks to identify and consider qualities, skills and other director attributes that would enhance the composition of the Board. In the case of incumbent directors whose terms of office are set to expire, the Nominating Committee reviews these directors' overall service to the Company during their terms, including the number of meetings attended, level of participation, quality of performance and any other relationships and transactions that might impair the directors' independence. The Nominating Committee also takes into account the results of the Board's self-evaluation, which was conducted in 2024 on an individual basis. In the case of new director candidates, the Nominating Committee also determines whether the nominee is independent for Nasdaq purposes, which determination is based upon applicable Nasdaq listing rules, applicable SEC rules and regulations and the advice of counsel, if necessary. The Nominating Committee then uses its network of contacts to compile a list of potential candidates, but may also engage, if it deems appropriate, a professional search firm. The Nominating Committee conducts any appropriate and necessary inquiries into the backgrounds and qualifications of possible candidates after considering the function and needs of the Board. The Nominating Committee meets to discuss and consider the candidates' qualifications and then selects a nominee for recommendation to the Board by majority vote.

The Nominating Committee will consider director candidates recommended by stockholders. The Nominating Committee does not intend to alter the manner in which it evaluates candidates, including the minimum criteria set forth above, based on whether or not the candidate was recommended by a stockholder. Stockholders who wish to recommend individuals for consideration by the Nominating Committee to become nominees for election to the Board may do so by delivering a written recommendation to the Nominating Committee no later than the close of business on the 90th day nor earlier than the close of business on the 120th day prior to the first anniversary of the preceding year's annual meeting at 611 Gateway Boulevard, Suite 740, South San Francisco, California 94080, Attention: Corporate Secretary. Submissions must include the full name of the proposed nominee, a description of the proposed nominee's business experience for at least the previous five years, complete biographical information, a description of the proposed nominee's qualifications as a director and a representation that the nominating stockholder is a beneficial or record holder of the Company's stock. Any such submission must be accompanied by the written consent of the proposed nominee to be named as a nominee and to serve as a director if elected.

Environmental, Social and Governance Matters

We are committed to developing and commercializing novel therapies for rare disorders with significant unmet medical need. We believe that our success depends on our ability to attract, develop and retain key personnel. We strive toward having a diverse team of employees and are committed to equality, inclusion and workplace diversity. For example, we provide various training and development programs that are intended to build and strengthen our employees' leadership and professional skills, and have multiple employee community groups to foster dialogue and other actions related to diversity and inclusion.

Stockholder Communications With the Board

The Board has adopted a formal process by which stockholders may communicate with the Board or any of its directors. Stockholders who wish to communicate with the Board may do so by sending written communications

addressed to 611 Gateway Boulevard, Suite 740, South San Francisco, California 94080, Attention: Corporate Secretary. Such written communications must set forth the name and address of the stockholder on whose behalf the communication is sent and the number of shares of our capital stock that are owned beneficially by such stockholder as of the date of the communication. All communications will be compiled by our Corporate Secretary and submitted to the Board or the individual directors on a periodic basis.

These communications will be reviewed by our Corporate Secretary, who will determine whether the communication should be presented to the Board. The purpose of this screening is to allow the Board to avoid having to consider irrelevant or inappropriate communications (such as advertisements, solicitations and hostile communications). The screening procedures have been approved by a majority of the independent directors.

Code of Conduct

We maintain a Code of Conduct that applies to all our employees, officers and directors. This includes our principal executive officer, principal financial officer and principal accounting officer or controller, or persons performing similar functions. The full text of our Code of Conduct is posted on our website at www.sprucebio.com. The information on our website is not incorporated by reference into this Proxy Statement or our Annual Report. If we ever were to waive or amend any provision of the Code of Conduct that applies to our principal executive officer, principal financial officer, principal accounting officer or any person performing similar functions, we intend to satisfy our disclosure obligations, if any, with respect to any such waiver or amendment by posting such information on our website set forth above rather than by filing a Current Report on Form 8-K.

Insider Trading Policy

We have adopted an insider trading policy governing the purchase, sale, and/or other dispositions of the Company's securities by directors, officers, employees and consultants that is designed to promote compliance with insider trading laws, rules and regulations, as well as procedures designed to further the foregoing purposes. A copy of our insider trading policy is filed as an exhibit to our Annual Report on Form 10-K for our fiscal year ended December 31, 2024. In addition, it is the Company's intent to comply with applicable laws and regulations relating to insider trading.

Prohibition on Speculative Trading

Under the terms of our insider trading policy, none of our employees, directors or consultants may engage in short sales, transactions in put options, call options or other derivative securities on an exchange or in any other organized market, or in any other inherently speculative transactions with respect to our capital stock. Further, none of our employees, directors or consultants may engage in hedging or monetization transactions at any time, including through the use of financial instruments such as prepaid variable forwards, equity swaps, collars and exchange funds with respect to our capital stock. In addition, none of our employees, directors or consultants may hold any of our securities in a margin account or otherwise pledge any of our securities, including as collateral for a loan, at any time.

**The disclosure under the caption "Prohibition on Speculative Trading" is not to be incorporated by reference in any filing of the Company under the Securities Act or the Exchange Act, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.*

Clawback Policy

As a public company, if we are required to restate our financial results due to our material noncompliance with any financial reporting requirements under the federal securities laws as a result of misconduct, the Chief Executive Officer and Chief Financial Officer may be legally required to reimburse our Company for any bonus or other incentive-based or equity-based compensation they receive in accordance with the provisions of section 304 of the Sarbanes-Oxley Act of 2002, as amended. As required by SEC rules, we have also implemented an incentive recoupment policy that is compliant with the Dodd-Frank Wall Street Reform and Consumer Protection Act.

Proposal 2
Ratification of Selection of Independent Registered Public Accounting Firm

The Audit Committee has selected BDO USA, P.C. as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2025 and has further directed that the Board submit the selection of its independent registered public accounting firm for ratification by the stockholders at the Annual Meeting. BDO USA, P.C. has audited the Company's financial statements since 2020. Representatives of BDO USA, P.C. are expected to be virtually present at the Annual Meeting. They will have an opportunity to make a statement if they so desire and will be available to respond to appropriate questions.

Neither the Company's amended and restated bylaws nor other governing documents or law require stockholder ratification of the selection of BDO USA, P.C. as the Company's independent registered public accounting firm. However, the Audit Committee is submitting the selection of BDO USA, P.C. to the stockholders for ratification as a matter of good corporate practice. If the stockholders fail to ratify the selection, the Audit Committee will reconsider whether or not to retain that firm. Even if the selection is ratified, the Audit Committee in its discretion may direct the appointment of different independent auditors at any time during the year if they determine that such a change would be in the best interests of the Company and its stockholders.

The affirmative vote of the holders of a majority of the shares present virtually or represented by proxy and entitled to vote on the matter at the Annual Meeting will be required to ratify the selection of BDO USA, P.C..

Principal Accountant Fees and Services

The following table represents aggregate fees charged by BDO USA, P.C. for the fiscal years ended December 31, 2024 and 2023.

	2024	2023
	(in thousands)	
Audit fees	\$ 473	\$ 577
Audit-related Fees	\$ —	\$ —
Tax fees	\$ —	\$ 72
All Other Fees	\$ —	\$ —
Total fees	\$ 473	\$ 649

Audit Fees. Consists of fees billed for professional services for audit and quarterly review of our financial statements and review of our registration statements on Form S-8 and Form S-3, our definitive proxy statement and related services that are normally provided in connection with statutory and regulatory filings or engagements.

Tax Fees. Consists of fees billed for tax advisory services.

All Audit Fees and Tax Fees described above were pre-approved by the Audit Committee.

Pre-Approval Policies and Procedures

Pursuant to its pre-approval policy, the Audit Committee must review and approve, in advance, the scope and plans for the audits and the audit fees and approve in advance (or, where permitted under the rules and regulations of the SEC, subsequently) all non-audit services to be performed by the independent registered public accounting firm that are not otherwise prohibited by law and any associated fees. The Audit Committee may delegate to one or more members of the Audit Committee the authority to pre-approve audit and permissible non-audit services, as long as this pre-approval is presented to the full committee at scheduled meetings.

**The Board Recommends
a Vote in Favor of Proposal 2**

Proposal 3 Reverse Stock Split

Overview

The Board has approved and declared advisable an amendment to our Amended and Restated Certificate of Incorporation to combine the outstanding shares of our Common Stock into a lesser number of outstanding shares, a so-called “reverse stock split.” If approved by the stockholders as proposed, the Board would have the sole discretion to effect the Reverse Stock Split at any time after approval of such amendment and to fix the specific ratio for the Reverse Stock Split, provided that the ratio would be not less than one-for-five and not more than one-for-thirty, inclusive. The Board would also have the discretion to abandon the Reverse Stock Split prior to its effectiveness.

We believe that enabling the Board to fix the specific ratio of the Reverse Stock Split within the stated range will provide our Board with the flexibility to react to then-current conditions and to implement the Reverse Stock Split in a manner designed to maximize the anticipated benefits for our stockholders. In fixing the ratio, the Board may consider, among other things, factors such as: the historical trading price and trading volume of our common stock; the number of shares of our common stock outstanding; the then-prevailing trading price and trading volume of our common stock; the anticipated impact of the Reverse Stock Split on the trading market for our common stock; potential financing opportunities; and prevailing general market and economic conditions.

The Reverse Stock Split, if approved by our stockholders, would become effective upon the filing of a Certificate of Amendment setting forth the Reverse Stock Split (the “Certificate of Amendment”) with the Secretary of State of the State of Delaware, or at the later time set forth in the Certificate of Amendment. The exact timing of the amendment will be determined by the Board based on its evaluation as to when such action will be the most advantageous to our Company and our stockholders. In addition, the Board reserves the right, notwithstanding stockholder approval and without further action by the stockholders, to abandon the Reverse Stock Split if, at any time prior to the effectiveness of the filing of the amendment with the Secretary of State of the State of Delaware, the Board, in its sole discretion, determines that it is no longer in our best interest and the best interests of our stockholders to proceed.

The proposed form of amendment to our Certificate of Incorporation to effect the Reverse Stock Split is attached as Appendix A to this proxy statement. However, the text of the proposed amendments is subject to revision to include such changes as may be required by the Secretary of State of the State of Delaware and as our Board deems necessary or advisable to effect the proposed amendment of our Certificate of Incorporation. Any amendment to our Certificate of Incorporation to effect the reverse stock split will include the reverse stock split ratio fixed by the Board, within the range approved by our stockholders.

Reasons for the Reverse Stock Split

Our primary objective in effectuating the Reverse Stock Split would be to attempt to raise the per-share trading price of our common stock to meet Nasdaq’s minimum listing requirements, which include, among other things, that our common stock have a per share bid price that is greater than or equal to \$1.00 per share. On the Record Date, the closing bid price for our common stock on Nasdaq was \$0.2951 per share. The Board also believes that a higher stock price may increase trading volume in our common stock and facilitate future financings by the Company.

Nasdaq Listing Requirements

As previously disclosed, on April 26, 2024, the Company received a deficiency letter (the “Nasdaq Letter”) from The Nasdaq Stock Market LLC (“Nasdaq”) notifying the Company that, for the last 30 consecutive business days, the closing bid price of the Company’s common stock had not been maintained at the minimum required closing bid price of at least \$1.00 per share, as required for continued listing pursuant to Nasdaq Listing Rule 5550(a) (2) (the “Bid Price Rule”). Also as previously reported, on October 24, 2024, the Company received an additional notification from the Listing Qualifications Staff of Nasdaq notifying the Company that the staff had approved the Company’s application to list its stock on the Nasdaq Capital Market, that the Company’s securities would be transferred to the Nasdaq Capital Market at the opening of business on October 28, 2024, and that the Company would be eligible for

an additional 180 calendar day period, or until April 21, 2025, to regain compliance with the Bid Price Rule.

On April 22, 2025, the Company received a written notification (the “Delisting Notice”) from Nasdaq that as a result of the Company’s ongoing failure to comply with the Bid Price Rule, the Company’s common stock will be delisted from Nasdaq and trading in the Company’s stock will be suspended at the open of trading on April 29, 2025. In connection with the delisting and suspension, the Company expects that Nasdaq will file a Form 25-NSE with the Securities and Exchange Commission, which will remove the Company’s securities from listing and registration on Nasdaq.

The Company has appealed Nasdaq’s determination to its Hearings Panel pursuant to the procedures set forth in the Nasdaq Listing Rule 5800 Series. However, pursuant to Nasdaq Listing Rule 5815(a)(1)(B)(ii)(d), a timely request for a hearing will not stay the trading suspension of the Company’s common stock as the Company was afforded the second 180 days compliance period described in Nasdaq Listing Rule 5810(c)(3)(A)(ii) and failed to regain compliance with the Bid Price Rule during such period.

As a result of the suspension in trading and expected delisting, the Company expects that its common stock will begin trading publicly on the over-the-counter market on April 29, 2025 under its existing symbol “SPRB”. The over-the-counter market is generally considered to have less trading volume and to be a less efficient market than the Nasdaq, making it more difficult for us to raise additional capital through the public or private sale of equity securities and for investors to dispose of or obtain accurate quotations as to the market value of our common stock. Many investors may be unable to buy or sell our common stock due to difficulty in accessing the over-the-counter market, policies preventing them from trading in securities not listed on a national exchange, or other reasons. Moreover, our common stock may come within the definition of “penny stock” under the Exchange Act, which imposes additional sales practice requirements on broker-dealers who sell securities to persons other than established customers and accredited investors. These requirements may reduce trading activity in the secondary market for our common stock and may impact the ability or willingness of broker-dealers to sell our securities which could limit the ability of stockholders to sell their securities in the public market and limit our ability to attract and retain qualified employees or raise additional capital in the future.

The Reverse Stock Split is a key component in our plan to regain compliance with the Nasdaq listing requirements. Accordingly, the Board recommended that our stockholders approve the Reverse Stock Split Proposal to effect the Reverse Stock Split and directed that this proposal be submitted to our stockholders for approval at the Special Meeting, including for the reasons discussed below.

Appeal to a Broader Range of Investors to Generate Greater Investor Interest in the Company

An increase in our stock price may make our common stock more attractive to investors. Brokerage firms may be reluctant to recommend lower-priced securities to their clients. Many institutional investors have policies prohibiting them from holding lower-priced stocks in their portfolios, which reduces the number of potential purchasers of our common stock. Investment funds may also be reluctant to invest in lower-priced stocks. Investors may also be dissuaded from purchasing lower-priced stocks because the brokerage commissions, as a percentage of the total transaction, tend to be higher for such stocks. Moreover, the analysts at many brokerage firms do not monitor the trading activity or otherwise provide coverage of lower-priced stocks. Giving the Board the ability to effect the Reverse Stock Split, and thereby increase the price of our common stock, would give the Board the ability to address these issues if it is deemed necessary.

Improve the Perception of Our common stock as an Investment Security

The Board believes that effecting the Reverse Stock Split is one potential means of increasing the share price of our common stock to improve the perception of our common stock as a viable investment security. Lower-priced stocks have a perception in the investment community as being risky and speculative, which may negatively impact not only the price of our common stock, but also our market liquidity.

Increase the Number of Shares of Common Stock Available for Issuance

The Board believes that the effective increase our available for issuance shares of common stock that would result from a Reverse Stock Split is necessary in order to provide us with the flexibility to issue additional shares in the future on a timely basis in connection with potential financings, strategic relationships, business combinations and strategic transactions, among other purposes, without the potential delay and expense associated with convening a special meeting of the stockholders. We have funded our operations to date primarily from the issuance and sale of our securities, and we currently have a limited number of authorized and unreserved shares that are available for future issuance.

In particular, the report of our independent registered public accounting firm that accompanies our audited consolidated financial statements for the year ended December 31, 2024 contained an explanatory paragraph regarding substantial doubt about our ability to continue as a going concern. As discussed in our Annual Report, based on our current operating plan, the Company's cash and cash equivalents of \$38.8 million as of December 31, 2024 will be insufficient to fund its planned operations and debt obligations for at least 12 months following the filing date of the Annual Report. The Company's ability to continue as a going concern will require the Company to raise additional capital to fund the Company's operations and there can be no assurance that additional financing will be available to the Company or that such financing, if available, will be available on terms acceptable to the Company. Accordingly, there is substantial doubt about the Company's ability to continue as a going concern. Our estimate as to how long we expect our existing cash and cash equivalents to be available to fund our operations is based on assumptions that may prove inaccurate, and we could use our available capital resources sooner than we currently expect. In addition, changing circumstances may cause us to increase our spending significantly faster than we currently anticipate, and we may need to spend more money than currently expected because of circumstances beyond our control. If we are unable to raise sufficient additional capital in the very near term, our current cash, cash equivalents and restricted cash would be insufficient to sustain our operations and, among other things, stockholder value would be harmed. Accordingly, if our stockholders do not approve this proposal, we will be limited in our ability to raise additional capital, which would materially and adversely affect our financial condition and our ability to continue as a going concern may be materially and adversely affected. Even if this proposal is approved by our stockholders, there is no assurance that we will be successful in raising additional financing. Based on our current business plans, we will continue to require additional capital in the very near term to fund our operating expenses and capital expenditure requirements, or we may need to further curtail or cease operations.

Our success also depends in part on our continued ability to attract, retain and motivate highly qualified directors, management and key personnel. If the Reverse Stock Split Proposal is not approved by our stockholders, the lack of available authorized shares of common stock to provide future equity incentive opportunities could adversely impact our ability to achieve these goals. In short, if our stockholders do not approve this proposal, we may not be able to access the capital markets, complete corporate collaborations or partnerships, attract, retain and motivate directors and employees, and pursue other business opportunities integral to our growth and success. The effective increase in the number of available shares of common stock upon approval and implementation of a Reverse Stock Split will not, by itself, have an immediate dilutive effect on our current stockholders. However, if this proposal is approved, unless otherwise required by applicable law or stock exchange rules, the Board will be able to issue additional shares of common stock from time to time in its discretion without further action or authorization by the stockholders. The newly available authorized shares of common stock would be issuable for any proper corporate purpose, including capital raising transactions of equity or convertible debt securities, the establishment of collaborations or other strategic agreements, stock splits, stock dividends, issuance under current or future equity incentive plans, future acquisitions, investment opportunities, or for other corporate purposes. The future issuance of additional shares of common stock or securities convertible into our common stock may occur at times or under circumstances that could result in a dilutive effect on the earnings per share, book value per share, voting power and percentage interest of the present holders of our common stock, some of whom have preemptive rights to subscribe for additional shares that we may issue.

Other than future issuances under our 2020 Equity Incentive Plan, 2016 Equity Incentive Plan, outstanding warrants, possible issuances of equity, convertible debt, or other securities, and the possible issuance of securities exercisable for our common stock to banks or other financial institutions, the Board currently has no specific plans, arrangements or understandings to issue the additional authorized shares of common stock that will effectively result from approval and implementation of a Reverse Stock Split. As of the date of this proxy statement, we have a sufficient number of authorized shares of common stock under our Amended and Restated Certificate of Incorporation, as

amended, as presently in effect to issue shares of common stock upon the exercise of all outstanding equity-linked obligations as they come due.

The Reverse Stock Split alone would have no effect on our authorized capital stock, and the total number of authorized shares would remain the same as before the reverse stock split. This would have the effect of increasing the number of shares of common stock available for issuance. As of the Record Date, the number of authorized shares of our common stock was 200,000,000 shares, which will not be affected by the Reverse Stock Split.

Criteria to be Used for Determining Whether to Implement Reverse Stock Split

In determining whether to implement the Reverse Stock Split and selecting the exchange ratio, the Board will consider various factors such as:

- the total number of shares of common stock outstanding;
- the requirements to regain Nasdaq listing of our common stock;
- the historical trading price and trading volume of our common stock;
- the then prevailing trading price and trading volume for our common stock;
- the anticipated impact of the Reverse Stock Split on the trading price of and market for our common stock;
- potential financing opportunities;
- prevailing general market and economic conditions; and
- whether and when our Board desires to have the additional authorized but unissued shares of common stock that will effectively result from the implementation of a Reverse Stock Split when available to provide the flexibility to use our common stock for business and/or financial purposes.

The Board will have sole discretion as to any implementation of, and the exact timing and actual ratio of, the Reverse Stock Split within the range of ratios specified in this proposal. The Board may also determine that the Reverse Stock Split is no longer in the best interests of our Company and our stockholders and decide to abandon the Reverse Stock Split at any time before, during or after the Special Meeting and prior to its effectiveness, without further action by the stockholders.

Risks Associated with the Reverse Stock Split

There are risks associated with the Reverse Stock Split, including that the Reverse Stock Split may not result in a lasting increase in the per share price of our common stock.

The Company cannot predict whether, or for how long, the Reverse Stock Split will increase the market price for our common stock. The history of similar stock split combinations for companies in like circumstances is varied. There is no assurance that:

- the market price per share will achieve the \$1.00 minimum bid price requirement for a sufficient period for our common stock to regain listing of our common stock on Nasdaq;
- we would otherwise meet the requirements that would allow us to regain listing of our common stock on Nasdaq;
- the market price per share of our common stock after the Reverse Stock Split will rise in proportion to the reduction in the number of shares of our common stock outstanding before the effective time of the Reverse Stock Split (the "Effective Time");

- the Reverse Stock Split will result in a per share price that will attract brokers and investors who do not trade in lower-priced stocks;
- the Reverse Stock Split will result in a per share price that will increase the ability of the Company to attract and retain employees; and
- the Reverse Stock Split would promote greater liquidity for our stockholders with respect to their shares.

In addition, the Reverse Stock Split would reduce the number of outstanding shares of our common stock without reducing the number of shares of available but unissued common stock, increasing the number of authorized but unissued shares of common stock. Therefore, the number of shares of our common stock that are authorized and unissued will increase relative to the number of issued and outstanding shares of our common stock following the Reverse Stock Split. The effective increase in the authorized number of shares of our common stock as a result of a Reverse Stock Split could, under certain circumstances, have anti-takeover implications. The additional shares of common stock that would become available for issuance if this proposal is approved and a Reverse Stock Split is implemented could be used by us to oppose a hostile takeover attempt or to delay or prevent changes in control or our management. For example, without further stockholder approval, the Board could adopt a “poison pill” which would, under certain circumstances related to an acquisition of our securities that is not approved by the Board, give certain holders the right to acquire additional shares of our common stock at a low price. The Board also could strategically sell shares of common stock in a private transaction to purchasers who would oppose a takeover or favor the current Board. Although this proposal has been prompted by business and financial considerations and not by the threat of any hostile takeover attempt (nor is the Board currently aware of any such attempts directed at us), stockholders should be aware that approval of this proposal could facilitate future efforts by us to deter or prevent changes in control, including transactions in which the stockholders might otherwise receive a premium for their shares over then current market prices.

In addition, the Board may authorize the issuance of the remaining authorized and unissued shares without further stockholder action for a variety of purposes, except as such stockholder approval may be required in particular cases by our Certificate of Incorporation, applicable law, or the rules of any stock exchange on which our securities may then be listed. The issuance of additional shares would be dilutive to our existing stockholders and may cause a decline in the trading price of our common stock.

The market price of our common stock will also be based on the performance of the Company and other factors, some of which are unrelated to the number of shares outstanding. If the Reverse Stock Split is effected and the market price of our common stock declines, the percentage decline as an absolute number and as a percentage of the overall market capitalization of the Company may be greater than would occur in the absence of the Reverse Stock Split.

Principal Effects of a Reverse Stock Split

The table below illustrates certain, but not all, possible reverse stock split ratios, together with the implied number of issued and outstanding shares of the common stock resulting from implementation of the Reverse Stock Split based on 42,231,285 shares of the common stock outstanding as of the Record Date.

	Current	After Reverse Stock Split if 5:1 Ratio is Selected ⁽¹⁾	After Reverse Stock Split if 10:1 Ratio is Selected ⁽¹⁾	After Reverse Stock Split if 20:1 Ratio is Selected ⁽¹⁾	After Reverse Stock Split if 30:1 Ratio is Selected ⁽¹⁾
Shares of common stock issued and outstanding	42,231,285	8,446,257	4,223,128	2,111,564	1,407,709
Common stock issuable upon exercise of stock options	3,284,576	656,915	328,457	164,228	109,485
Common Stock issuable upon exercise of warrants	14,794,341	2,958,868	1,479,434	739,717	493,144
Common stock issuable upon vesting of restricted stock units	2,279,435	455,887	227,943	113,971	75,981
Common stock reserved under the 2020 Plan for future grants	4,312,253	862,450	431,225	215,612	143,741
Common Stock reserved under the 2020 ESPP	1,349,079	269,815	134,907	67,453	44,969
Authorized but unissued and reserved	131,749,031	26,349,806	13,174,903	6,587,451	4,391,634

⁽¹⁾ Excludes the effect of fractional share treatment.

We are exploring various sources of financing, including through potential future sales of common stock or other securities. There can be no assurance, however, even if the Reverse Stock Split is approved and implemented, that any financing transaction would be undertaken or completed. If we are unable to successfully raise sufficient additional capital, through future sales of common stock or other securities or through strategic and collaborative arrangements, we will not have sufficient cash to fund our planned business operations and or may not be able to continue as a going concern.

As of the Record Date, we had 42,231,285 shares of common stock issued and outstanding, 3,284,576 shares of common stock reserved for issuance upon the exercise of outstanding options, 2,279,435 shares reserved for issuance upon vesting of restricted stock units, 14,794,341 shares of common stock reserved for issuance upon the exercise of outstanding warrants, no shares of common stock reserved for future issuance under the Company's 2016 Equity Incentive Plan, 4,312,253 shares of common stock reserved for future issuance under the Company's 2020 Equity Incentive Plan and 1,349,079 shares of common stock reserved for future issuance under the Company's 2020 Employee Stock Purchase Plan. As of the Record Date, we have no shares of preferred stock outstanding, which would not change with the effectiveness of the Reverse Stock Split.

Procedure for Implementing the Reverse Stock Split

Beneficial Holders of Common Stock

Upon the implementation of the Reverse Stock Split, we intend to treat shares of our common stock held by stockholders through a bank, broker or other nominee in the same manner as registered stockholders whose shares are registered in their own names. Banks, brokers or other nominees will be instructed to effect the Reverse Stock Split for their beneficial holders holding our common stock in street name. However, these banks, brokers or other nominees may have different procedures than registered stockholders for processing the Reverse Stock Split. Stockholders who hold shares of our common stock with a bank, broker or other nominee and who have any questions in this regard are encouraged to contact their banks, brokers or other nominees.

Registered “Book-Entry” Holders of Common Stock

Certain of our registered holders of common stock may hold some or all of their shares of our common stock electronically in book-entry form with the transfer agent. These stockholders do not have stock certificates evidencing their ownership of the common stock. They are, however, provided with statements reflecting the number of shares registered in their accounts. Stockholders who hold shares of our common stock electronically in book-entry form with the transfer agent will not need to take action to receive evidence of their shares of post-Reverse Stock Split common stock.

Holders of Certificated Shares of Common Stock

Stockholders holding shares of our common stock in certificated form will be sent a transmittal letter by the transfer agent after the effective time of the Reverse Stock Split. The letter of transmittal will contain instructions on how a stockholder should surrender his, her or its certificate(s) representing shares of our common stock (the “Old Certificates”) to the transfer agent. Unless a stockholder specifically requests a new paper certificate or holds restricted shares, upon the stockholder’s surrender of all of the stockholder’s Old Certificates to the transfer agent, together with a properly completed and executed letter of transmittal, the transfer agent will register the appropriate number of shares of post-Reverse Stock Split common stock electronically in book-entry form and provide the stockholder with a statement reflecting the number of shares registered in the stockholder’s account. No stockholder will be required to pay a transfer or other fee to exchange his, her or its Old Certificates. Until surrendered, we will deem outstanding Old Certificates held by stockholders to be cancelled and only to represent the number of shares of post-Reverse Stock Split common stock to which these stockholders are entitled. Any Old Certificates submitted for exchange, whether because of a sale, transfer or other disposition of stock, will automatically be exchanged for the appropriate number of shares of post-Reverse Stock Split common stock. If an Old Certificate has a restrictive legend on its reverse side, a new certificate will be issued with the same restrictive legend on its reverse side.

STOCKHOLDERS SHOULD NOT DESTROY ANY STOCK CERTIFICATE(S) AND SHOULD NOT SUBMIT ANY STOCK CERTIFICATE(S) UNTIL REQUESTED TO DO SO.

Fractional Shares

No fractional shares of common stock will be issued as a result of any Reverse Stock Split. Instead, in lieu of any fractional shares to which a stockholder of record would otherwise be entitled as a result of a Reverse Stock Split, we will pay cash (without interest) equal to such fraction multiplied by the average of the closing sales prices of the common stock during regular trading hours for the five consecutive trading days immediately preceding the Effective Date (with such average closing sales prices being adjusted to give effect to a Reverse Stock Split) (“Fractional Share Payment”). After such Reverse Stock Split, a stockholder otherwise entitled to a fractional interest will not have any voting, dividend or other rights with respect to such fractional interest except to receive payment as described above.

Stockholders should be aware that, under the escheat laws of the various jurisdictions where stockholders reside, where we are domiciled and where the funds will be deposited, sums due for fractional interests that are not timely claimed after the effective time may be required to be paid to the designated agent for each such jurisdiction. Thereafter, stockholders otherwise entitled to receive such funds may have to seek to obtain them directly from the state to which they were paid.

Effect of the Reverse Stock Split on Outstanding Stock Options, Warrants, and Employee Plans

Based upon the reverse stock split ratio, proportionate adjustments are generally required to be made to the per share exercise price and the number of shares issuable upon the exercise of all outstanding options, warrants entitling the holders to purchase shares of common stock. This would result in approximately the same aggregate price being required to be paid under such options, warrants or convertible preferred stock upon exercise, and approximately the same value of shares of common stock being delivered upon such exercise immediately following the Reverse Stock Split as was the case immediately preceding the Reverse Stock Split. The number of shares reserved for issuance pursuant to these securities will be reduced proportionately based upon the reverse stock split ratio.

Potential Effects of the Reverse Stock Split

If our stockholders approve the Reverse Stock Split and the Board effects it, the number of shares of common stock authorized and issued and outstanding will be reduced due to the Reverse Stock Split, depending upon the ratio determined by the Board. The Reverse Stock Split will affect all holders of our common stock uniformly and will not affect any stockholder's percentage ownership interest in the Company, except that as described above in "*Fractional Shares*," record holders of common stock otherwise entitled to a fractional share as a result of the Reverse Stock Split because they hold a number of shares not evenly divisible by the Reverse Stock Split ratio will automatically be entitled to receive the Fractional Share Payment automatically and without any action by the holder. In addition, the Reverse Stock Split will not affect any stockholder's proportionate voting power (subject to the treatment of fractional shares).

The Reverse Stock Split will not change the terms of the common stock. After the Reverse Stock Split, the shares of common stock will have the same voting rights and rights to dividends and distributions and will be identical in all other respects to the common stock now authorized. The common stock will remain fully paid and non-assessable. The Reverse Stock Split may result in some stockholders owning "odd-lots" of less than 100 shares of our common stock. Brokerage commissions and other costs of transactions in odd-lots are generally higher than the costs of transactions in "round-lots" of even multiples of 100 shares.

After the Effective Time, we will continue to be subject to the periodic reporting and other requirements of the Exchange Act. If a Reverse Stock Split is effected, then after the Effective Time, our common stock will have a new Committee on Uniform Securities Identification Procedures ("CUSIP") number, which is a number used to identify our equity securities, and stock certificates for our common stock with the older CUSIP number will need to be exchanged for stock certificates with the new CUSIP number by following the procedures described above under "*Procedure for Implementing the Reverse Stock Split*." The Reverse Stock Split is not intended as, and will not have the effect of, a "going private transaction" as described by Rule 13e-3 under the Exchange Act.

Accounting Matters

The proposed amendment to our Certificate of Incorporation will not affect the par value of our common stock. As a result, at the effective time of the Reverse Stock Split, the stated capital on our balance sheet attributable to the common stock will be reduced in the same proportion as the reverse stock split ratio, and the additional paid-in capital account will be credited with the amount by which the stated capital is reduced. The per share net income or loss and net book value of the common stock will be reclassified for prior periods to conform to the post-Reverse Stock Split presentation.

Certain U.S. Federal Income Tax Consequences of the Reverse Stock Split

The following is a summary of certain material U.S. federal income tax consequences of the Reverse Stock Split that generally are expected to be applicable to U.S. Holders (as defined below) of our common stock who hold their common shares, both before and after the Reverse Stock Split, as capital assets within the meaning of Section 1221 of Internal Revenue Code of 1986, as amended (the "Code") (generally property held for investment). This summary is based on provisions of the Code, applicable Treasury Regulations promulgated thereunder, judicial authority and current administrative rulings and practices as in effect on the date of this proxy statement. Changes to these laws could alter the tax consequences described below, possibly with retroactive effect, which may result in the U.S. federal income tax consequences of the Reverse Stock Split differing substantially from the consequences summarized below. We have not sought and will not seek an opinion of counsel or a ruling from the Internal Revenue Service regarding the U.S. federal income tax consequences of the Reverse Stock Split and there can be no assurance that the Internal Revenue Service or the courts will accept the positions expressed below.

This discussion is for general information only and does not purport to consider all aspects of U.S. federal income taxation that might be relevant to a U.S. Holder. This discussion does not address the tax consequences which may apply to stockholders subject to special rules, such as financial institutions, insurance companies, tax-exempt organizations, dealers in securities, real estate investment trusts, regulated investment companies, stockholders who hold their pre-Reverse Stock Split shares through individual retirement or other tax-deferred accounts, stockholders

who are not U.S. Holders (as defined below), stockholders who have a functional currency other than the U.S. dollar, partnerships, S corporations or other entities or arrangements classified as partnerships or disregarded entities for U.S. federal income tax purposes (or persons holding our common stock through such entities), stockholders who hold the pre-Reverse Stock Split shares as part of a straddle, hedge, conversion transaction or other integrated or risk reduction transaction, stockholders who hold the pre-Reverse Stock Split shares as qualified small business stock within the meaning of Section 1202 of the Code or Section 1244 stock for purposes of Section 1244 of the Code, stockholders who acquired their common stock in a transaction subject to the gain rollover provisions of Section 1045 of the Code, or stockholders who acquired their pre-Reverse Stock Split shares pursuant to the exercise of employee stock options or otherwise as compensation.

In addition, this summary does not address: (a) the tax consequences of transactions effectuated before, after or at the same time as the Reverse Stock Split, whether or not they are in connection with the Reverse Stock Split; (b) any U.S. federal non-income tax consequences of the Reverse Stock Split, including estate, gift or other tax consequences; (c) any state, local or non-U.S. tax consequences of the Reverse Stock Split; (d) the application of the alternative minimum tax, the Medicare contribution tax on net investment income, or the special tax accounting rules under Section 451(b) of the Code, or (e) tax consequences to holders of options, warrants or similar rights to acquire our common stock. Stockholders are urged to consult their own tax advisors to determine the particular consequences to them.

For purposes of this discussion, a “U.S. Holder” means a beneficial owner of shares of our common stock that is any of the following:

- an individual who is a citizen or resident of the United States or someone treated as a U.S. citizen or resident for U.S. federal income tax purposes;
- a corporation (or other entity taxable as a corporation for U.S. federal income tax purposes) created or organized in or under the laws of the United States, any state thereof, or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income taxation regardless of its source; or
- a trust if (i) a U.S. court can exercise primary supervision over the trust’s administration and one or more “United States persons” (within the meaning of Section 7701(a)(30) of the Code) are authorized or have the authority to control all substantial decisions of the trust or (ii) it has a valid election in effect under applicable U.S. Treasury Regulations to be treated as a United States person for U.S. federal income tax purposes.

Tax Consequences of the Reverse Stock Split

The Reverse Stock Split should constitute a “recapitalization” for U.S. federal income tax purposes. In general, the U.S. federal income tax consequences of a Reverse Stock Split will vary depending upon whether a U.S. Holder receives cash for fractional shares or solely a reduced number of shares of common stock in exchange for its pre-Reverse Stock Split shares of common stock. A U.S. Holder that receives solely a reduced number of shares of common stock generally will not recognize gain or loss in the Reverse Stock Split. A U.S. Holder’s aggregate tax basis in the reduced number of shares of common stock should equal the U.S. Holder’s aggregate tax basis in its pre-Reverse Stock Split shares of common stock and such U.S. Holder’s holding period in the reduced number of shares will include the holding period in its pre-Reverse Stock Split shares of common stock exchanged. Treasury Regulations provide detailed rules for allocating the tax basis and holding period of the shares of common stock surrendered to the shares of common stock received in a recapitalization pursuant to the Reverse Stock Split. U.S. Holders should consult their tax advisors as to application of the foregoing rules where shares of common stock were acquired at different times or at different prices.

No gain or loss will be recognized by the Company as a result of the proposed Reverse Stock Split.

Cash in Lieu of Fractional Shares

A U.S. Holder that receives cash in lieu of a fractional share as a result of the Reverse Stock Split will be treated as having received the fractional shares pursuant to the Reverse Stock Split and then as having exchanged the fractional shares for cash in a redemption by the Company and generally should recognize gain or loss equal to the difference, if any, between the amount of cash received in lieu of fractional shares and the stockholder’s adjusted basis allocable

to the fractional share interests. Such gain or loss will be a long-term capital gain or loss if the pre-Reverse Stock Split shares were held for more than one year. Long-term capital gains of individuals are generally subject to tax at reduced rates. There are limitations on the deductibility of capital losses under the Code. A U.S. Holder's aggregate tax basis in the reduced number of shares of common stock should equal the U.S. Holder's aggregate tax basis in its pre-Reverse Stock Split shares of common stock decreased by the basis allocated to the fractional share for which such U.S. Holder is entitled to receive cash, and the holding period of the reduced number of shares of common stock received should include the holding period of the pre-Reverse Stock Split shares of common stock exchanged.

Information Reporting and Backup Withholding

A holder of shares of common stock may be subject to information reporting and backup withholding on cash paid in lieu of fractional shares in connection with the Reverse Stock Split. To avoid backup withholding, each holder of shares of common stock that does not otherwise establish an exemption should provide its taxpayer identification number and comply with the applicable certification procedures. Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules generally will be allowed as a refund or credit against a U.S. Holder's U.S. federal income tax liability, provided the required information is timely and properly furnished to the Internal Revenue Service. Holders of shares of common stock should consult their tax advisors regarding their qualification for an exemption from backup withholding and the procedures for obtaining such an exemption, as well as the procedures for obtaining a credit or refund if backup withholding is imposed.

The preceding discussion is intended only as a summary of certain material U.S. federal income tax consequences of the Reverse Stock Split. It is not a complete analysis or discussion of all potential tax effects that may be important to a particular holder. All holders of our common stock should consult their own tax advisors as to the specific tax consequences of the Reverse Stock Split them, including record retention and tax-reporting requirements, and the applicability and effect of any U.S. federal, state, local and non-U.S. tax laws.

THE FOREGOING IS A SUMMARY OF CERTAIN MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES OF THE REVERSE STOCK SPLIT, AND DOES NOT CONSTITUTE A TAX OPINION. EACH HOLDER OF OUR COMMON SHARES SHOULD CONSULT ITS TAX ADVISOR REGARDING THE TAX CONSEQUENCES OF THE REVERSE STOCK SPLIT.

Amendment Effective Date

If the proposed amendment to the Certificate of Incorporation as described in this Proposal No. 3 is approved by the stockholders, upon the Board's determination, if any, to effectuate the Reverse Stock Split and of the ratio (within the range approved pursuant to this Proposal No. 3) of such Reverse Stock Split, the Company will file the Certificate of Amendment reflecting the adopted amendment with the Secretary of State of the State of Delaware. The Certificate of Amendment will be effective upon its filing or at such later time as specified in the Certificate of Amendment. If the stockholders do not approve this Proposal No. 3, the Certificate of Amendment will not be filed with the Secretary of State of the State of Delaware.

Dissenters' Rights

No dissenters' rights are available under the General Corporation Law of the State of Delaware or under the Certificate of Incorporation or the Bylaws to any stockholder who dissents from this Proposal No. 3.

No Appraisal Rights

Our stockholders are not entitled to appraisal rights with respect to the Reverse Split, and we will not independently provide stockholders with any such right.

Interests of Directors and Executive Officers

Our directors and executive officers do not have substantial interest, directly or indirectly, in the matters set forth in this proposal except to the extent of their ownership of shares of common stock or any other of our securities.

**The Board Recommends
a Vote in Favor of Proposal 3.**

Proposal 4
Approval of an Adjournment to the Annual Meeting, if Necessary,
to Solicit Additional Proxies

If the Annual Meeting is convened and a quorum is present but there are not sufficient votes to approve Proposal 3, our proxy holders may move to adjourn the Annual Meeting at that time in order to enable the Board to solicit additional proxies.

In this proposal, we are asking our stockholders to authorize the holder of any proxy solicited by the Board to vote in favor of adjourning the Annual Meeting to another time and place, if necessary or appropriate (as determined in good faith by the Board), to solicit additional proxies in the event there are not sufficient votes to approve Proposal 3. If our stockholders approve this proposal, we could adjourn the Annual Meeting and any adjourned or postponed session of the Annual Meeting and use the additional time to solicit additional proxies, including the solicitation of proxies from our stockholders that have previously voted. Among other things, approval of this proposal could mean that, even if we had received proxies representing a sufficient number of votes to defeat Proposal 3, we could adjourn the Annual Meeting without a vote on such proposal and seek to convince our stockholders to change their votes in favor of such proposal.

If it is necessary or appropriate (as determined in good faith by the Board) to adjourn the Annual Meeting, no notice of the adjourned meeting is required to be given to our stockholders, other than an announcement at the Annual Meeting of the time and place to which the Annual Meeting is adjourned, so long as the meeting is adjourned for 30 days or less and no new record date is fixed for the adjourned meeting. At the adjourned meeting, we may transact any business which might have been transacted at the original meeting.

The Board Recommends
a Vote in Favor of Proposal 4.

EXECUTIVE OFFICERS

Each of our executive officers serves at the discretion of the Board. The determination as to which of our employees qualify as executive officers was made by the Board in accordance with the rules of the SEC. Biographical information for our executive officers as of the Record Date is set forth below. The following table identifies our current executive officers, their age, and their respective offices and positions. Biographies of Dr. Szwarcberg and Mr. Grey are described under the section titled “Proposal 1 Election of Directors – Directors Continuing in Office until the Company’s 2026 Annual Meeting of Stockholders”.

<u>Name</u>	<u>Age</u>	<u>Position</u>
Javier Szwarcberg, M.D., MPH	55	Chief Executive Officer and Director
Samir Gharib	42	President and Chief Financial Officer

Javier Szwarcberg, M.D., MPH, biographical information regarding Dr. Szwarcberg is set forth under “Proposal 1: Election of Directors.”

Samir Gharib has served as our President since January 2022 and as our Chief Financial Officer since May 2020. From September 2019 to May 2020, Mr. Gharib provided consulting services to various companies with Benchmark Financial Partners (“Benchmark”), a strategic financial advisory firm. From October 2018 to September 2019, Mr. Gharib was the Chief Financial Officer of Stemedica Cell Technologies, Inc., a global pharmaceutical company focused on the development and commercialization of cell therapeutics for underserved medical conditions. From September 2017 to October 2018, Mr. Gharib served as Managing Director of Benchmark. From October 2013 to September 2017, Mr. Gharib held positions of increasing responsibility at Revance Therapeutics, Inc., a commercial-stage biotechnology company, including Vice President of Finance and Administration. From January 2011 to September 2013, Mr. Gharib was the Corporate Controller, Director of Finance for Talon Therapeutics, Inc. Mr. Gharib has been an advisor to Berkeley SkyDeck since January 2020. Mr. Gharib received a Bachelor of Science and M.B.A. from the Haas School of Business at the University of California at Berkeley, and is an active Certified Public Accountant licensed in the State of California.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The following table sets forth information regarding beneficial ownership of our common stock as of April 1, 2025 (the “Ownership Measurement Date”) by:

- each person, or group of affiliated persons, known by us to beneficially own more than 5% of our common stock;
- each of our directors, including the nominees named herein;
- each of our named executive officers; and
- all of our current executive officers and directors as a group.

We have determined beneficial ownership in accordance with the rules and regulations of the SEC, and the information is not necessarily indicative of beneficial ownership for any other purpose. In computing the number of shares beneficially owned by a stockholder and the percentage ownership of such stockholder, we deemed to be outstanding all shares subject to options held by the stockholder that are currently exercisable or exercisable as of May 31, 2025, which is 60 days after the Ownership Measurement Date. These shares are deemed to be outstanding and beneficially owned by the stockholder holding such options for the purpose of computing the percentage ownership of that person, but they are not treated as outstanding for the purpose of computing the percentage ownership of any other stockholder. Except as indicated by the footnotes below and subject to community property laws where applicable, we believe, based on information furnished to us, that the stockholders named in the table below have sole voting and sole investment power with respect to all shares that they beneficially own, subject to applicable community property laws. This table is based upon information supplied by officers and directors and Schedules 13D and 13G filed with the SEC.

Applicable percentage ownership is based on 42,231,285 shares of our common stock outstanding as of the Ownership Measurement Date.

Unless otherwise indicated, the address for each stockholder listed in the table below is c/o Spruce Biosciences, Inc., 611 Gateway Boulevard, Suite 740, South San Francisco, California 94080.

Name of Beneficial Owner	Number of Shares Beneficially Owned	Percentage of Shares Beneficially Owned
Greater than 5% Holders:		
Bradley L. Radoff ⁽¹⁾	3,975,000	9.4%
Entities affiliated with Rock Springs Management LP ⁽²⁾	3,437,125	8.0%
Abingworth Bioventures VII LP ⁽³⁾	2,989,018	7.1%
HealthCap VIII, L.P. ⁽⁴⁾	2,977,621	7.1%
Armistice Capital Master Fund Ltd. ⁽⁵⁾	2,169,245	5.1%
Named Executive Officers and Directors:		
Javier Szwarcberg, M.D., MPH ⁽⁶⁾	1,217,191	2.8%
Samir Gharib ⁽⁷⁾	777,768	1.8%
Ralph William Charlton III, M.D., M.A.S. ⁽⁸⁾	333,214	*
Michael Grey ⁽⁹⁾	439,745	1.0%
Camilla V. Simpson, M.Sc. ⁽¹⁰⁾	157,617	*
Daniel Spiegelman ⁽¹¹⁾	123,565	*
Bali Muralidhar, M.D., Ph.D. ⁽¹²⁾	92,500	*
Percival Barretto-Ko ⁽¹³⁾	70,000	*

Kirk Ways, M.D., Ph.D. ⁽¹⁴⁾	100,625	*
Tiba Aynechi, Ph.D. ⁽¹⁵⁾	82,500	*
All current executive officers and directors as a group (9 persons) ⁽¹⁶⁾	3,061,511	6.9%

* Represents beneficial ownership of less than 1%.

- (1) Consists of (i) 3,800,000 shares of common stock held by Bradley Radoff and (ii) 175,000 shares of common stock owned by The Radoff Family Foundation (“Radoff Foundation”). Mr. Radoff, as a director of Radoff Foundation, may also be deemed the beneficial owner of the 175,000 shares owned by the Radoff Foundation. Mr. Radoff has sole voting and dispositive power over all of the shares owned by himself and the Radoff Foundation. The address of the principal office of Mr. Radoff and Radoff Foundation is 2727 Kirby Drive, Unit 29L, Houston, Texas 77098.
- (2) Consists of (i) 2,328,500 shares of common stock held by Rock Springs Capital Master Fund LP (“Master Fund”), (ii) 280,625 shares of common stock held by Four Pines Master Fund LP (“Four Pines”), (iii) 690,907 shares of common stock subject to warrants exercisable within 60 days of the Ownership Measurement Date held by Master Fund and (iv) 137,093 shares of common stock subject to warrants exercisable within 60 days of the Ownership Measurement Date held by Four Pines. Rock Springs Capital Management, LP (“RSCM”) serves as the investment manager to each of the Master Fund and Four Pines. Rock Springs Capital LLC (“RSC”) is the general partner of RSCM. Each of RSCM and RSC may be deemed to be the indirect beneficial owners of 2,726,689 shares of common stock, and may be deemed to have shared voting and dispositive power with respect to such shares. The address of RSCM and RSC is 650 South Exeter St., Suite 1070, Baltimore, MD 21202. The address of Master Fund is c/o Walkers Corporate Limited, Cayman Corporate Centre, 27 Hospital Road, George Town, Grand Cayman, KY1-9008, Cayman Islands.
- (3) Consists of (i) 2,896,518 shares of common stock held by Abingworth Bioventures VII LP (“Abingworth VII”) and (ii) 92,500 shares of common stock issuable upon the exercise of vested stock options held by Bali Muralidhar, a managing partner of Abingworth. The Carlyle Group Inc., which is a publicly traded entity listed on Nasdaq, is the sole shareholder of Carlyle Holdings I GP Inc., which is the sole member of Carlyle Holdings I GP Sub L.L.C., which is the general partner of Carlyle Holdings I L.P., which, with respect to the securities reported herein, is the managing member of CG Subsidiary Holdings L.L.C., which is the managing member of TC Group, L.L.C., which is the managing member of Carlyle Investment Management, L.L.C., which is the sole member of Carlyle Genesis UK LLC, which is the principal member of Abingworth LLP. Abingworth VII has delegated to Abingworth LLP all investment and dispositive power over the securities held of record by Abingworth VII. The shares subject to the options held by Dr. Muralidhar are deemed to be beneficially owned by Abingworth LLP. The number of shares beneficially owned by Abingworth LLP is limited by beneficial ownership limitations applicable to the exercise of warrants purchased in the Private Placement by Abingworth VII, which limit the number of shares such entity can beneficially own after the exercise of warrants to a maximum of 4.99% of our outstanding common stock, unless the holder changes such limitations upon written notice to us. As a result of such limitations, the number of shares beneficially owned does not include up to an aggregate of 828,000 shares of common stock issuable upon exercise of certain warrants purchased in the Private Placement by Abingworth VII. The address of Abingworth VII is c/o Abingworth LLP, 38 Jermyn Street, London SW1Y 6DN, U.K.
- (4) Consists of 2,977,621 shares of common stock held by HealthCap VIII, L.P. HealthCap VIII GP SA, a Swiss registered L.C.C. (“HCSA”), is the sole general partner of the fund HealthCap VIII, L.P. (“HCLP”). HCSA has voting and dispositive power over the shares held by HCLP. HCSA disclaims beneficial ownership of such shares, except to the extent of their pecuniary interest therein. Fabrice Bernhard serves as General Manager of HCSA and each of Dag Richter and Daniel Schafer serves as Director of HCSA. Each of Messrs. Bernhard, Richter and Schafer may be deemed to share voting and investment power with respect to the shares held by HCLP except to the extent of their pecuniary interest therein. The number of shares beneficially owned by such entities is limited by beneficial ownership limitations applicable to the exercise of warrants purchased in the Private Placement by HCLP, which limit the number of shares HCLP can beneficially own after the exercise of warrants to a maximum of 4.99% of our outstanding common stock, unless the holder changes such limitations upon written notice to us. As a result of such limitations, the number of shares beneficially owned does not include up to an aggregate of 708,000 shares of common stock issuable upon exercise of certain warrants purchased in the Private Placement by HCLP. The address of HealthCap VIII, L.P. is c/o HealthCap VIII GP SA Avenue Villamont 23 – CH 1005, Lausanne, Switzerland.
- (5) Consists of 2,169,245 shares of common stock held by Armistice Capital Master Fund Ltd., a Cayman Islands exempted company (the “Master Fund”), and may be deemed to be indirectly beneficially owned by (i) Armistice Capital, LLC (“Armistice”), as the investment manager of the Master Fund, and (ii) Steven Boyd, as the Managing Member of Armistice. Armistice and Steven Boyd disclaim beneficial ownership of the reported securities except to the extent of their respective pecuniary interest therein. The number of shares beneficially owned by Armistice and Mr. Boyd is limited by beneficial ownership limitations applicable to the exercise of the warrants purchased in the Private Placement by the Master Fund, which limit the number of shares such entity can beneficially own after the exercise of warrants, to a maximum of 4.99% of our outstanding common stock, unless the holder changes such limitations upon written notice to us. As a result of such limitations, the number of shares beneficially owned does not include up to an aggregate of 3,546,000 shares of common stock issuable upon exercise of warrants purchased in the Private Placement by the Master Fund. The address of the Master Fund is c/o Armistice Capital, LLC, 510 Madison Avenue, 7th Floor, New York, NY 10022.
- (6) Consists of 467,191 shares of our common stock held by Dr. Szwarcberg and 750,000 shares of our common stock subject to options exercisable within 60 days of the Ownership Measurement Date held by Dr. Szwarcberg.
- (7) Consists of 350,550 shares of our common stock held by Mr. Gharib and 427,218 shares of our common stock subject to options exercisable within 60 days of the Ownership Measurement Date held by Mr. Gharib.
- (8) Consists of 161,339 shares of our common stock held by Dr. Charlton and 171,875 shares of our common stock subject to options exercisable within 60 days of the Ownership Measurement Date held by Dr. Charlton.

- (9) Consists of 439,745 shares of our common stock subject to options exercisable within 60 days of the Ownership Measurement Date held by Mr. Grey.
- (10) Consists of 157,617 shares of our common stock subject to options exercisable within 60 days of the Ownership Measurement Date held by Ms. Simpson.
- (11) Consists of 123,565 shares of our common stock subject to options exercisable within 60 days of the Ownership Measurement Date held by Mr. Spiegelman.
- (12) Consists of 92,500 shares of our common stock subject to options exercisable within 60 days of the Ownership Measurement Date held by Dr. Muralidhar.
- (13) Consists of 70,000 shares of our common stock subject to options exercisable within 60 days of the Ownership Measurement Date held by Mr. Barretto-Ko.
- (14) Consists of 100,625 shares of our common stock subject to options exercisable within 60 days of the Ownership Measurement Date held by Dr. Ways.
- (15) Consists of 82,500 shares of our common stock subject to options exercisable within 60 days of the Ownership Measurement Date held by Dr. Aynechi.
- (16) Consists of (i) 817,741 shares of common stock held by our current directors and executive officers as a group and (ii) 2,243,770 shares of common stock issuable upon the exercise of stock options held by our current directors and executive officers that are exercisable within 60 days of the Ownership Measurement Date.

Delinquent Section 16(a) Reports

Section 16(a) of the Exchange Act requires the Company's directors and executive officers, and persons who own more than ten percent of a registered class of the Company's equity securities, to file with the SEC initial reports of ownership and reports of changes in ownership of common stock and other equity securities of the Company.

Officers, directors and greater than 10% stockholders are required by SEC regulation to furnish the Company with copies of all Section 16(a) forms they file.

Due to administrative delays, each of Dr. Szwarcberg, Dr. Charlton and Mr. Gharib failed to timely file three Form 4 reports reflecting the vesting and net settlement of certain RSUs.

EXECUTIVE COMPENSATION

Our named executive officers for the year ended December 31, 2024, consisting of our principal executive officer and the next two most highly compensated executive officers, were:

- Javier Szwarcberg, M.D., MPH, our Chief Executive Officer;
- Samir Gharib, our President and Chief Financial Officer; and
- Ralph William Charlton III, M.D., M.A.S., our former Chief Medical Officer⁽¹⁾

(1) Dr. Charlton ceased employment with us as of December 31, 2024.

We are an “emerging growth company,” as that term is used in the Jumpstart Our Business Startups Act of 2012 (the “JOBS Act”), and have elected to comply with the reduced compensation disclosure requirements available to emerging growth companies under the JOBS Act.

Summary Compensation Table

The following table presents all of the compensation awarded to or earned by or paid to our named executive officers during the fiscal years indicated below.

Name and Principal Position	Fiscal Year	Salary (\$)	Bonus (\$) ⁽¹⁾	Stock Awards (\$) ⁽²⁾	Option Awards (\$)	Non-Equity Incentive Plan Compensation (\$) ⁽³⁾	All Other Compensation (\$) ⁽⁴⁾	Total (\$)
Javier Szwarcberg, M.D., MPH Chief Executive Officer	2024	610,000	335,500	581,687	—	—	5,000	1,532,187
Samir Gharib President and Chief Financial Officer	2023	580,000	47,850	1,205,568	—	319,000	5,000	2,157,418
	2024	465,100	209,925	249,665	—	—	5,000	929,690
	2023	447,200	30,186	517,440	—	201,240	5,000	1,201,066
Ralph William Charlton III, M.D., M.A.S. Former Chief Medical Officer ⁽⁵⁾	2024	457,600	183,040	172,496	—	—	348,200	1,161,336
	2023	440,000	26,400	357,504	—	176,000	5,000	1,004,904

(1) Amounts disclosed for fiscal year 2024 reflect retention bonuses earned and paid in 2024. Amounts disclosed for fiscal year 2023 reflect discretionary upward adjustments to target short-term incentive compensation earned in 2023 and paid in early 2024.

(2) The dollar amounts in this column reflect the aggregate grant date fair value of restricted stock unit (“RSU”) and performance stock unit (“PSU”) awards granted during the indicated fiscal year computed in accordance with Financial Accounting Standards Board (“FASB”) Accounting Standards Committee (“ASC”) Topic 718, excluding the effect of estimated forfeitures. The grant date fair value of each RSU is measured based on the closing price of our common stock on the date of grant. For accounting purposes, the grant date fair value of PSUs was calculated based on the probable outcome of achieving the performance metric as of the grant date. The 2024 PSUs were granted on March 14, 2024, at a fair value of \$0.8106 per share. Assuming the performance conditions will be achieved, the grant date fair value of the 2024 PSUs for each of our NEOs is as follows: Dr. Szwarcberg, \$581,687; Mr. Gharib, \$249,665; and Dr. Charlton, \$172,496. These amounts do not necessarily correspond to the actual value recognized or that may be recognized by the named executive officers.

(3) Amounts disclosed for fiscal year 2023 reflect short-term incentive compensation earned in 2023 and paid in early 2024.

(4) Amounts shown in this column represent \$5,000 paid to each officer in matching payments under our 401(k) Plan, a qualified deferred compensation plan under Section 401(k) of the Internal Revenue Code of 1986, as amended. For Dr. Charlton, this amount also includes \$343,200 in severance payments, paid in 2025 in connection with the termination of his employment on December 31, 2024.

(5) Dr. Charlton departed as Chief Medical Officer in December 2024.

Annual Base Salary

The 2024 annual base salaries for our named executive officers are set forth in the table below.

Name	2024 Base Salary
Javier Szwarcberg, M.D., MPH	\$610,000
Samir Gharib	\$465,100
Ralph William Charlton III, M.D., M.A.S.	\$457,600

Compensation for our NEOs is reviewed and approved annually by the Board. The Board considers executive and company performance, compensation benchmarks of peer companies, and other discretionary factors in its overall assessment of and changes to compensation.

Annual Incentive Plan Compensation

We seek to motivate, reward and retain our executives for achievements relative to our corporate goals and expectations for each fiscal year. Each of our named executive officers is eligible to receive an annual performance bonus based on the achievement of performance goals as determined by the Board or an authorized committee thereof. Each named executive officer is assigned a target bonus expressed as a percentage of his base salary. The target bonus amounts for Dr. Szwarcberg, Mr. Gharib and Dr. Charlton for 2024 were set at 55%, 45%, and 40%, respectively. Annual performance bonuses for Dr. Szwarcberg, Mr. Gharib and Dr. Charlton for 2024 were approved in the amounts of \$335,500, \$209,295 and \$183,040, respectively. These amounts were guaranteed as retention payments by the Compensation Committee in March 2024 and as such are reflected in the “Bonus” column of the Summary Compensation Table above.

Equity-Based Incentive Awards

In 2024, we granted RSU and PSU awards to each of our named executive officers pursuant to the 2020 Plan.

Javier Szwarcberg, M.D., MPH

On March 14, 2024, we granted Dr. Szwarcberg 358,800 RSUs. The RSUs vest over a four-year period, with one quarter of the RSUs vesting on December 10, 2025 and one quarter of the total number of shares initially underlying the RSU will vest in annual installments on each anniversary of the thereafter, subject to Dr. Szwarcberg’s continued service to us. On March 14, 2024, we also granted Dr. Szwarcberg 358,800 PSUs. The PSUs vest upon the achievement of specified financing and strategic objectives, subject to Dr. Szwarcberg’s continued service to us.

Samir Gharib

On March 14, 2024, we granted Mr. Gharib 154,000 RSUs. The RSUs vest over a four-year period, with one quarter of the RSUs vesting on December 10, 2025 and one quarter of the total number of shares initially underlying the RSU will vest in annual installments on each anniversary of the thereafter, subject to Mr. Gharib’s continued service to us. On March 14, 2024, we also granted Mr. Gharib 154,000 PSUs. The PSUs vest upon the achievement of specified financing and strategic objectives, subject to Mr. Gharib’s continued service to us.

Ralph William Charlton III, M.D., M.A.S.

On March 14, 2024, we granted Dr. Charlton 106,400 RSUs. The RSUs would have vested over a four-year period, with one quarter of the RSUs vesting on December 10, 2025 and one quarter of the total number of shares initially underlying the RSU will vest in annual installments on each anniversary of the thereafter, subject to Dr.

Charlton's continued service to us. On March 14, 2024, we also granted Dr. Charlton 106,400 PSUs. The PSUs would have vested upon the achievement of specified financing and strategic objectives. These RSU and PSU awards will not vest since Dr. Charlton's service to the company terminated in December 2024.

401(k) Plan

We maintain a 401(k) plan that provides eligible U.S. employees with an opportunity to save for retirement on a tax advantaged basis. Eligible employees are able to defer eligible compensation up to certain Code limits, which are updated annually. We have the ability to make matching and discretionary contributions to the 401(k) plan. Currently, we make matching contributions, but no discretionary contributions, to the 401(k) plan. The 401(k) plan is intended to be qualified under Section 401(a) of the Code, with the related trust intended to be tax exempt under Section 501(a) of the Code. As a tax-qualified retirement plan, contributions to the 401(k) plan are deductible by us when made, and contributions and earnings on those amounts are not generally taxable to the employees until withdrawn or distributed from the 401(k) plan.

Other Compensation and Benefits

All of our current named executive officers are eligible to participate in our employee benefit plans, including our medical, dental, vision, disability, and life insurance plans, in each case on the same basis as all of our other employees. We pay the premiums for the life, disability, accidental death, and dismemberment insurance for all of our employees, including our named executive officers. We generally do not provide perquisites or personal benefits to our named executive officers.

Outstanding Equity Awards as of December 31, 2024

The following table presents the outstanding equity incentive plan awards held by each named executive officer as of December 31, 2024.

Name	Grant Date	Option Awards ⁽¹⁾				Stock Awards				
		Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Equity Incentive Plan Awards: Number of Securities Underlying Unexercised Unearned Options (#)	Option Exercise Price Per Share (\$) ⁽²⁾	Option Expiration Date	Number of Shares or Units of Stock That Have Not Vested (#) ⁽³⁾	Market Value of Shares or Units of Stock That Have Not Vested (\$) ⁽⁴⁾	Equity Incentive Plan Awards: Number of Unearned Shares, Units or Other Rights That Have Not Vested (#) ⁽⁵⁾	Equity Incentive Plan Awards: Market or Payout Value of Unearned Shares, Units or Other Rights That Have Not Vested (\$) ⁽⁶⁾
Javier Szwarcberg	1/03/2022 ⁽⁷⁾	546,875	203,125	—	4.59	1/2/2032	—	—	—	—
	1/03/2022 ⁽⁸⁾	125,000	—	—	4.59	1/2/2032	—	—	—	—
	12/05/2022 ⁽⁹⁾	—	—	—	—	—	222,000	93,240	—	—
	12/14/2023 ⁽¹⁰⁾	—	—	—	—	—	269,100	113,022	—	—
	03/14/2024 ⁽¹¹⁾	—	—	—	—	—	358,800	150,696	—	—
	03/14/2024 ⁽¹²⁾	—	—	—	—	—	—	—	358,800	150,696
Samir Gharib	6/08/2020 ⁽³⁾	118,483	—	—	1.64	6/07/2030	—	—	—	—
	8/07/2020 ⁽⁴⁾	71,548	—	—	3.07	8/06/2030	—	—	—	—
	1/28/2021 ⁽¹⁵⁾	53,854	1,146	—	20.08	1/27/2031	—	—	—	—
	12/16/2021 ⁽¹⁶⁾	108,750	36,250	—	2.48	12/15/2031	—	—	—	—
	1/03/2022 ⁽¹⁷⁾	51,041	18,959	—	4.59	1/3/2032	—	—	—	—
	12/05/2022 ⁽⁹⁾	—	—	—	—	—	74,500	31,290	—	—
	12/14/2023 ⁽¹¹⁾	—	—	—	—	—	115,500	48,510	—	—
	03/14/2024 ⁽¹²⁾	—	—	—	—	—	154,000	64,680	—	—
	03/14/2024 ⁽¹²⁾	—	—	—	—	—	—	—	154,000	64,680
Ralph William Charlton III	4/01/2022 ⁽¹⁸⁾	171,875	—	—	2.13	04/01/2032	—	—	—	—

- (1) All of the option awards granted prior to our initial public offering in October 2020 were granted under our 2016 Equity Incentive Plan (the “2016 Plan”). All of the option awards granted since our initial public offering in October 2020 were granted under the 2020 Plan, other than Dr. Szwarcberg’s January 2022 option awards granted as inducement grants in accordance with Nasdaq Listing Rule 5635(c)(4) outside the 2020 Plan but pursuant to the terms of the 2020 Plan as if such awards were made under the 2020 Plan.
- (2) All of the option awards granted prior to our initial public offering in October 2020 were granted with a per share exercise price equal to the fair market value of one share of our common stock on the date of grant, as determined in good faith by the Board or compensation committee. All of the option awards granted since our initial public offering in October 2020 were granted with a per share exercise price equal to the closing sales price on the date of grant.
- (3) Awards in this column consist of RSU awards that were unvested as of December 31, 2024.
- (4) Amounts in this column represent the market value for RSU awards that were unvested as of December 31, 2024. The market value of the RSU award is calculated by multiplying the number of shares underlying the RSU award shown in the table by \$0.42, the closing price of our common stock on December 31, 2024.
- (5) Awards in this column consist of PSU awards that were unearned and unvested as of December 31, 2024.
- (6) Amounts in this column represent the market value for PSU awards that were unearned and unvested as of December 31, 2024. The market value of the PSU award is calculated by multiplying the number of shares underlying the PSU award shown in the table by \$0.42, the closing price of our common stock on December 31, 2024.
- (7) One-fourth of the shares subject to the option award vested on January 3, 2023, and the balance vests in equal monthly installments over the three years thereafter.
- (8) 125,000 shares subject to the option award vested upon the achievement of a specified clinical development milestone.
- (9) One-fourth of the shares vested on December 15, 2023, and one-third of the remaining shares vest on each anniversary thereafter, subject to continued service to us as of each such date.
- (10) One-fourth of the shares vested on December 15, 2024, and one-third of the remaining shares vest on each anniversary thereafter, subject to continued service to us as of each such date.
- (11) One-fourth of the shares will vest on December 10, 2025, and one-third of the remaining shares vest on each anniversary thereafter, subject to continued service to us as of each such date.

- (12) The shares will vest in a single installment upon either the achievement of certain financing metrics/consummation of a Change of Control (as defined in the 2020 Plan) or the completion of an equity financing of the Company resulting in at least \$50 million of gross proceeds (prior to commissions and offering expenses).
- (13) One-fourth of the shares subject to the option award vested on May 1, 2021, and the balance vests in equal monthly installments over the three years thereafter. The option includes an early exercise feature.
- (14) One-fourth of the shares subject to the option award vested on each monthly anniversary of August 7, 2020, subject to continued service to us. The option includes an early exercise feature.
- (15) One-fourth of the shares subject to the option award shall vest on each monthly anniversary of January 28, 2021, subject to continued service to us.
- (16) One-fourth of the shares subject to the option award shall vest on each monthly anniversary of December 16, 2021, subject to continued service to us.
- (17) One-fourth of the shares subject to the option award shall vest on each monthly anniversary of January 3, 2022, subject to continued service to us.
- (18) One-fourth of the shares subject to the option award vested on March 28, 2023, and the balance vested in equal monthly installments until Dr. Charlton's termination on December 31, 2024.

Options held by our named executive officers are eligible for accelerated vesting under specified circumstances as further described under the section titled "Executive Compensation—Potential Payments Upon Termination or Change of Control".

Employment and Letter Agreements

Below are descriptions of our employment and letter agreements with our named executive officers. For a discussion of the severance pay and other benefits to be provided in connection with a termination of employment and/or a change in control under the arrangements with our named executive officers, see the section titled "Executive Compensation—Potential Payments Upon Termination or Change of Control" below.

Dr. Szwarcberg. We entered into an offer letter agreement with Dr. Szwarcberg in December 2021, which governs the current terms of Dr. Szwarcberg's employment with us. Pursuant to the agreement, Dr. Szwarcberg is entitled to an initial annual base salary of \$540,000, is eligible to receive an annual performance bonus with a target achievement of 50% of his base salary, as determined by the Board, and was granted options to purchase an aggregate of 1,000,000 shares of our common stock. In April 2022, we entered into an amendment to Dr. Szwarcberg's offer letter, pursuant to which we amended Dr. Szwarcberg's entitlement to certain severance benefits, the terms of which are described below under "—Potential Payments Upon Termination or Change of Control." In December 2023, the Board confirmed Dr. Szwarcberg's target bonus for 2024 performance was to be 55% of his annual base salary and approved an increase in his base salary to \$610,000 for 2024. Dr. Szwarcberg is also eligible for standard benefits such as vacation and paid time off and to participate in employee benefit plans and programs, in each case, as generally available to our regular full-time employees. Dr. Szwarcberg's employment is at will.

Mr. Gharib. We entered into an offer letter agreement with Mr. Gharib in April 2020, which governs the current terms of Mr. Gharib's employment with us. Pursuant to the agreement, Mr. Gharib was entitled to an initial annual base salary of \$330,000 (which was subsequently increased by the Board to \$380,000, effective immediately prior to our initial public offering), was eligible to receive an annual performance bonus with a target achievement of 30% of his base salary (which was subsequently increased by the Board to 40%, effective immediately prior to our initial public offering), as determined by the Board. In December 2021, the Board increased Mr. Gharib's annual base salary for 2022 to \$414,300. In January 2022, in connection with his appointment as President, the Board further increased Mr. Gharib's annual base salary for 2022 to \$430,000 and increased his target bonus for 2022 performance to 45% of his annual base salary. In December 2023, the Board further increased Mr. Gharib's annual base salary for 2024 to \$465,100 and confirmed that his target bonus for 2024 performance was to remain at 45% of his annual base salary. Mr. Gharib is also eligible for standard benefits such as vacation and paid time off and to participate in employee benefit plans and programs, in each case, as generally available to our regular full-time employees. Mr. Gharib's employment is at will. Mr. Gharib is also entitled to certain severance benefits, the terms of which are described below under "—Potential Payments Upon Termination or Change of Control."

Dr. Charlton. We entered into an offer letter agreement with Dr. Charlton in March 2022, which governed the current terms of Dr. Charlton’s employment with us. Pursuant to the agreement, Dr. Charlton was entitled to an initial annual base salary of \$400,000, was eligible to receive an annual performance bonus with a target achievement of 40% of his base salary, as determined by the Board, and was granted an option to purchase an aggregate of 250,000 shares of our common stock. Dr. Charlton was also entitled to certain severance benefits, the terms of which are described below under “— Potential Payments Upon Termination or Change of Control.” Dr. Charlton also eligible for standard benefits such as vacation and paid time off and to participate in employee benefit plans and programs, in each case, as generally available to our regular full-time employees. Dr. Charlton’s employment was at will.

Potential Payments Upon Termination or Change of Control

Severance Plan

Each of our current named executive officers, except Dr. Charlton whose employment ceased as of December 31, 2024, is eligible for our severance and change in control plan (the “Severance Plan”), which was adopted by the Board in September 2020 and became effective in connection with our initial public offering. The Severance Plan provides for severance benefits upon (i) a “change in control termination” or (ii) a “regular termination” (each as described below). Upon a change in control termination, participants will be entitled to continued payment of base salary (for 18 months for Dr. Szwarcberg and for 12 months for Mr. Gharib), a lump sum payment equal to the participant’s target cash bonus, payment of continued group health benefits (for up to 18 months for Dr. Szwarcberg and for up to 12 months for Mr. Gharib), and full accelerated vesting of all outstanding equity awards granted following effectiveness of the Severance Plan (including performance-based awards, which shall vest at 100% of target). Pursuant to the terms of his amended offer letter agreement with us, with respect to his option award for 250,000 shares of common stock granted January 3, 2022 only, the vesting acceleration benefits under the Severance Plan applicable to a change of control termination for Dr. Szwarcberg will only apply for a Change in Control (as defined in the Severance Plan) with an effective date on or after January 3, 2023. Upon a regular termination, participants will be entitled to continued payment of base salary (for 12 months for Dr. Szwarcberg and for nine months for Mr. Gharib) and payment of continued group health benefits (for up to 12 months for Dr. Szwarcberg and for up to nine months for Mr. Gharib).

All severance benefits under the Severance Plan are subject to the participant’s execution of an effective release of claims against the company and compliance with the terms of the company’s standard confidentiality agreement. For purposes of the Severance Plan, a “regular termination” is an involuntary termination (i.e., a termination other than for “cause,” as defined in the 2020 Plan (and not as a result of death or disability), or a resignation for “good reason,” as defined in the Severance Plan) that does not occur during the period of time beginning three months prior to, and ending 12 months following, a “change in control” (as defined in the 2020 Plan), or the “change in control period.” A “change in control termination” is an involuntary termination that occurs during the change in control period (the period commencing 3 months prior to the effective date of the change in control and ending 12 months following the effective date of the change in control).

In connection with Dr. Charlton’s departure in December 2024, Dr. Charlton is entitled to receive benefits pursuant to the Company’s Severance and Change in Control Plan, including an amount equal to nine months of salary continuation at his base salary rate, or \$343,200, and continued coverage under COBRA equal to nine months, in exchange for granting and not revoking a customary release of claims.

Employee Benefit Plans

We believe that our ability to grant equity-based awards is a valuable and necessary compensation tool that aligns the long-term financial interests of our employees, consultants and directors with the financial interests of our stockholders. In addition, we believe that our ability to grant options and other equity-based awards helps us to attract, retain and motivate employees, consultants, and directors, and encourages them to devote their best efforts to our business and financial success. The principal features of our equity incentive plans and our 401(k) plan are summarized below. These summaries are qualified in their entirety by reference to the actual text of the plans, which, other than the 401(k) plan, are filed as exhibits to the Annual Report.

2020 Equity Incentive Plan

The Board adopted our 2020 Plan in September 2020 and our stockholders approved our 2020 Plan in October 2020. Our 2020 Plan provides for the grant of incentive stock options (“ISOs”) to employees, including employees of any parent or subsidiary, and for the grant of nonstatutory stock options (“NSOs”) stock appreciation rights, restricted stock awards, restricted stock unit awards, performance awards and other forms of stock awards to employees, directors, and consultants, including employees and consultants of our affiliates. Our 2020 Plan is a successor to and continuation of our 2016 Plan, which is described below. The 2020 Plan became effective immediately prior to and contingent upon the execution of the underwriting agreement related to our initial public offering.

Initially, the maximum number of shares of our common stock that may be issued under our 2020 Plan was 2,647,684 shares. In addition, the number of shares of our common stock reserved for issuance under our 2020 Plan is subject to an automatic increase on January 1 of each calendar year through January 1, 2030, in an amount equal to 5% of the total number of shares of our common stock outstanding on the last day of the calendar month before the date of each automatic increase, or a lesser number of shares determined by the Board. Pursuant to the automatic increase provision of the 2020 Plan, the number of shares of our common stock reserved for issuance under our 2020 Plan was increased by 2,051,491 shares on January 1, 2024 and 2,111,564 shares on January 1, 2025.

Amended and Restated 2016 Equity Incentive Plan

Our 2016 Plan was originally adopted by the Board and approved by our stockholders in April 2016. It was subsequently amended in October 2019 and amended and restated in February 2020. Our 2016 Plan allows for the grant of ISOs to employees, including employees of any parent or subsidiary, and for the grant of NSOs, restricted stock awards, restricted stock units and other stock-based awards to employees, directors, and consultants, including employees and consultants of our affiliates.

No further grants can be made under our 2016 Plan following the effectiveness of our 2020 Plan. Any outstanding awards granted under our 2016 Plan will remain subject to the terms of our 2016 Plan and applicable award agreements.

The maximum number of shares of our common stock that may be issued under our 2016 Plan is 2,697,738 shares.

2020 Employee Stock Purchase Plan

The Board adopted our 2020 Employee Stock Purchase Plan (the “ESPP”), in September 2020 and our stockholders approved our ESPP in October 2020. The ESPP became effective immediately prior to the execution of the underwriting agreement related to our initial public offering. The purpose of the ESPP is to secure the services of new employees, to retain the services of existing employees, and to provide incentives for such individuals to exert maximum efforts toward our success and that of our affiliates. The ESPP includes two components. One component is designed to allow eligible U.S. employees to purchase our common stock in a manner that may qualify for favorable tax treatment under Section 423 of the Internal Revenue Code of 1986, as amended (the “Code”). In addition, purchase rights may be granted under a component that does not qualify for such favorable tax treatment because of deviations necessary to permit participation by eligible employees who are foreign nationals or employed outside of the U.S. while complying with applicable foreign laws.

The ESPP initially authorized the issuance of 220,640 shares of our common stock under purchase rights granted to our employees or to employees of any of our designated affiliates. The number of shares of our common stock reserved for issuance is subject to an automatic increase on January 1 of each calendar year through January 1, 2030, by the lesser of (i) 1% of the total number of shares of our common stock outstanding on the last day of the calendar month before the date of the automatic increase, and (ii) 441,280 shares; provided, that before the date of any such increase, the Board may determine that such increase will be less than the amount set forth in clauses (i) and (ii). Pursuant to the automatic increase provision of the ESPP, the number of shares of our common stock reserved for issuance under our ESPP was increased by 410,298 shares on January 1, 2024 and 422,312, shares on January 1, 2025.

Equity Compensation Plan Information

The following table provides certain information as of December 31, 2024, with respect to all of our equity compensation plans in effect on that date.

Plan Category	Number of Securities to be Issued upon Exercise of Outstanding Options, Warrants and Rights	Weighted-average Exercise Price of Outstanding Options, Warrants and Rights ⁽³⁾	Number of Securities Remaining Available for Future Issuance under Equity Compensation Plans (Excluding Securities Reflected in Column (a))
	(a)	(b)	(c)
Equity compensation plans approved by security holders ⁽¹⁾	4,825,865 ⁽²⁾	\$2.81	2,990,602 ⁽⁴⁾
Equity compensation plans not approved by security holders	875,000	\$4.59	-
Total	5,700,865 ⁽²⁾	\$3.26	2,990,602 ⁽⁴⁾

(1) Consists of the 2016 Plan, the 2020 Plan and the 2020 Employee Stock Purchase Plan (the “ESPP”). The number of shares of our common stock reserved for issuance under the 2020 Plan is subject to an automatic increase on January 1st of each year, for a period of ten years, commencing on January 1, 2021 and ending on (and including) January 1, 2030, in an amount equal to 5% of the total number of shares of our common stock outstanding on December 31 of the preceding year; provided, however, that the Board may act prior to January 1st of a given year to provide that the increase for such year will be a lesser number of shares of our common stock. The number of shares of our common stock reserved for issuance under the ESPP is subject to an automatic increase on January 1st of each year, for a period of ten years, commencing on January 1, 2021 and ending on (and including) January 1, 2030, in an amount equal to the lesser of (i) 1% of the total number of shares of our common stock outstanding on December 31st of the preceding calendar year, (ii) 441,280 shares of our common stock and (iii) a number of shares of our common stock designated by action of the Board prior to the applicable January 1st. On January 1, 2025, the numbers of shares of our common stock reserved for issuance under the 2020 Plan and the ESPP were increased by 2,111,564 shares and 422,312 shares, respectively, pursuant to the automatic increase provisions of such plans.

(2) Consists of shares of our common stock issuable upon exercise of 2,586,155 outstanding stock options and vesting of 2,239,710 outstanding RSUs and PSUs.

(3) The weighted-average exercise price excludes RSUs and PSUs.

(4) Consists of shares available for future issuance under the 2020 Plan and the ESPP. As of December 31, 2024, 2,063,835 shares of our common stock were available for issuance under the 2020 Plan, and 926,767 shares of our common stock were available for issuance under the ESPP.

Policies and Practices Related to the Grant of Certain Equity Awards Close in Time to the Release of Material Nonpublic Information

From time to time, the Company grants stock options to its employees, including the named executive officers. The Company did not grant options to its executive officers in 2024. For more information on the Company’s practices regarding grants for non-executive employees, please see the section “— Compensation Committee—Compensation Committee Processes and Procedures—” above.

For executive officers, the Company has historically granted new-hire option awards on or soon after a new hire’s employment start date. Also, non-employee directors receive automatic grants of initial and annual stock option awards, at the time of a director’s initial appointment or election to the board and at the time of each annual meeting of the Company’s stockholders, respectively, pursuant to the Non-Employee Director Compensation Policy, as further described under the heading, “Director Compensation” below. The Company does not otherwise maintain any written policies on the timing of awards of stock options, stock appreciation rights, or similar instruments with option-like features. The Compensation Committee considers whether there is any material nonpublic information (“MNPI”) about the Company when determining the timing of stock option grants and does not seek to time the award of stock options in relation to the Company’s public disclosure of MNPI. The Company has not timed the release of MNPI for the purpose of affecting the value of executive compensation.

Director Compensation

The following table sets forth information for the fiscal year ended December 31, 2024 concerning the compensation paid to all of our non-employee directors. Dr. Szwarcberg, our Chief Executive Officer did not receive additional compensation in connection with his service as a director, and therefore is not included in the Director Compensation table below. See the section titled “Executive Compensation” for more information regarding the compensation earned by Dr. Szwarcberg.

Director Compensation for Fiscal 2024

Name	Fees Earned or Paid in Cash (\$)	Option Awards (\$) ⁽¹⁾	All Other Compensation (\$)	Total (\$)
Tiba Aynechi, Ph.D.	50,000	19,224	—	69,224
Percival Barretto-Ko	47,500	19,224	—	66,724
Michael Grey	70,000	19,224	—	89,224
Bali Muralidhar, Ph.D.	45,000	19,224	—	64,224
Niall O’Donnell, Ph.D. ⁽²⁾	18,642	—	—	18,642
Daniel Spiegelman	59,000	19,224	—	78,224
Camilla Simpson, M.Sc.	53,577	19,224	—	72,801
Kirk Ways, M.D., Ph.D. ⁽³⁾	48,000	19,224	3,750	70,974

(1) Amounts shown in this column do not reflect dollar amounts actually received by non-employee directors. Instead, these amounts reflect the aggregate grant date fair value of each stock option granted computed in accordance with the provisions of FASB ASC Topic 718. Assumptions used in the calculation of these amounts are included in Note 10 to our consolidated financial statements included in our Annual Report. Our non-employee directors will only realize compensation to the extent the trading price of our common stock is greater than the exercise price of such stock options. As of December 31, 2024, Dr. Aynechi held options to purchase 82,500 shares of our common stock; Mr. Barretto-Ko held options to purchase 90,000 shares of our common stock; Mr. Grey held options to purchase 447,037 shares of our common stock; Dr. Muralidhar held options to purchase 92,500 shares of our common stock; Mr. Spiegelman held options to purchase 123,565 shares of our common stock; Ms. Simpson held options to purchase 157,617 shares of our common stock; and Dr. Ways held options to purchase 100,625 shares of our common stock.

(2) Dr. O’Donnell resigned from the Board in May 2024.

(3) Dr. Ways received \$3,750 in consulting fees from his services as interim Chief Medical Officer in December 2024.

We have reimbursed and will continue to reimburse all of our non-employee directors for their reasonable out-of-pocket expenses incurred in attending board of directors and committee meetings.

The Board adopted a non-employee director compensation policy in September 2020 that became effective immediately prior to the execution and delivery of the underwriting agreement related to our initial public offering, which is applicable to all of our non-employee directors. The non-employee director compensation policy was further amended in March 2023. This compensation policy provides that each such non-employee director will receive the following compensation for service on the Board:

- an annual cash retainer of \$40,000;
- an additional annual cash retainer of \$30,000 to the executive chairman of the Board;
- an additional annual cash retainer (not applicable to committee chairs) of \$7,500, \$5,000, and \$4,000 for service as a member of the audit committee, compensation committee and the nominating and corporate governance committee, respectively;
- an additional annual cash retainer of \$15,000, \$10,000, and \$8,000 for service as chair of the audit committee, compensation committee and the nominating and corporate governance committee, respectively;

- an initial option grant to purchase 60,000 shares of our common stock on the date of each such non-employee director’s appointment to the Board, vesting monthly over three years; and
- an annual option grant to purchase 30,000 shares of our common stock on the date of each of our annual stockholder meetings, vesting on the earlier of (i) the first anniversary of the grant date and (ii) the date of the next annual meeting, provided that such grant is pro-rated based on the number of full months the director has served on the Board, if less than 12 months prior to the applicable annual stockholder meeting.

Each of the option grants described above will be granted under our 2020 Plan, the terms of which are described in more detail under the section titled “Executive Compensation—Employee Benefit Plans—2020 Equity Incentive Plan.” Each such option grant will vest and become exercisable subject to the director’s continuous service to us, provided that each grant will vest in full upon a change in control of our company, as defined in the 2020 Plan. The term of each option will be ten years, subject to earlier termination as provided in the 2020 Plan.

TRANSACTIONS WITH RELATED PERSONS AND INDEMNIFICATION

The following includes a summary of transactions since January 1, 2023 to which we have been a party in which the amount involved exceeded or will exceed the lesser of \$120,000 or 1% of the average of our total assets at year-end for the last two completed fiscal years, and in which any of our directors, director nominees, executive officers or, to our knowledge, beneficial owners of more than 5% of our capital stock or any member of the immediate family of any of the foregoing persons had or will have a direct or indirect material interest, other than equity and other compensation, termination, change in control and other arrangements, which are described under “Executive Compensation.” We also describe below certain other transactions with our directors, executive officers and stockholders.

Participation in 2023 Private Placement Offering

In February 2023, we entered into Securities Purchase Agreement (the “Purchase Agreement”) with certain institutional investors, relating to a private placement of shares of our common stock, pre-funded warrants to purchase shares of our common stock and warrants to purchase shares of our common stock (the “Private Placement”). Pursuant to the Purchase Agreement, we issued and sold an aggregate of 16,116,000 shares of our common stock to the purchasers, along with 800,000 shares of common stock subject to a pre-funded warrant and 12,687,000 shares of common stock subject to warrants (collectively, the “Warrants”). Our Private Placement closed on February 16, 2023. Certain holders of more than 5% of our capital stock (including shares of common stock acquired in the Private Placement), including those holders affiliated with members of our Board, purchased shares of our common stock in the Private Placement at the offering price offered to other investors.

The following table sets forth the number of shares of our common stock purchased and the aggregate cash purchase price paid by each of these stockholders.

Name	Shares of Common Stock Purchased	Pre-funded Warrants Purchased	Warrants Purchased	Aggregate Cash Purchase Price \$
Novo Holdings A/S ⁽¹⁾	2,208,000	—	1,656,000	6,999,360
Entities affiliated with RiverVest Venture Fund III, L.P. ⁽²⁾	788,000	—	591,000	2,497,960
Abingworth Bioventures VII LP ⁽³⁾	1,104,000	—	828,000	3,499,680
HealthCap VIII, L.P. ⁽⁴⁾	944,000	—	708,000	2,992,480
Entities affiliated with Rock Springs Management LP ⁽⁵⁾	1,104,000	—	828,000	3,499,680
Armistice Capital Master Fund Ltd. ⁽⁶⁾	3,928,000	800,000	3,546,000	14,979,760
5AM Opportunities II, L.P. ⁽⁷⁾	2,364,000	—	1,773,000	7,493,880

(1) Novo Holdings A/S is the beneficial owner of more than 5% of our outstanding capital stock. Tiba Aynechi, Ph.D. is a member of our board of directors and was previously employed as a Senior Partner at Novo Ventures (US) Inc., which provides certain consultancy services to Novo Holdings A/S.

(2) Entities affiliated with RiverVest Venture Fund III, L.P. are the beneficial owners of more than 5% of our outstanding capital stock. At the time of the financing, Niall O’Donnell, Ph.D. was a member of our board of directors and serves as Managing Director at RiverVest Venture Partners.

(3) Abingworth Bioventures VII LP is the beneficial owner of more than 5% of our outstanding capital stock. Bali Muralidhar, M.D., Ph.D. is a member of our board of directors and serves as Managing Partner of Abingworth LLP, an affiliate of Abingworth Bioventures VII LP.

(4) HealthCap VIII, L.P. is the beneficial owner of more than 5% of our outstanding capital stock. Jonas Hansson, a former member of our board of directors, was formerly employed as a partner at HealthCap Advisor AB, an entity affiliated with HealthCap VIII, L.P.

(5) Entities affiliated with Rock Springs Management LP collectively beneficially own more than 5% of our outstanding capital stock.

(6) Armistice Capital Master Fund Ltd. is the beneficial owner of more than 5% of our outstanding capital stock.

(7) 5AM Opportunities II, L.P. was the beneficial owner of more than 5% of our outstanding capital stock at the time of the financing.

Policies and Procedures for Transactions with Related Persons

We have adopted a written policy that our executive officers, directors, nominees for election as a director, beneficial owners of more than 5% of any class of our common stock and any members of the immediate family of any of the foregoing persons are not permitted to enter into a related person transaction with us without the approval or ratification of the Board or our Audit Committee. Any request for us to enter into a transaction with an executive officer, director, nominee for election as a director, beneficial owner of more than 5% of any class of our common stock, or any member of the immediate family of any of the foregoing persons, in which the amount involved exceeds \$120,000 (or, if less, 1% of the average of our total assets in a fiscal year) and such person would have a direct or indirect interest, must be presented to the Board or our Audit Committee for review, consideration and approval. In approving or rejecting any such proposal, the Board or our Audit Committee is to consider the material facts of the transaction, including whether the transaction is on terms comparable to the terms generally available to an unaffiliated third party under the same or similar circumstances and the extent of the related person's interest in the transaction.

HOUSEHOLDING OF PROXY MATERIALS

The SEC has adopted rules that permit companies and intermediaries (e.g., brokers) to satisfy the delivery requirements for Notices of Internet Availability of Proxy Materials or other Annual Meeting materials with respect to two or more stockholders sharing the same address by delivering a single Notice of Internet Availability of Proxy Materials or other Annual Meeting materials addressed to those stockholders. This process, which is commonly referred to as “householding,” potentially means extra convenience for stockholders and cost savings for companies.

This year, a number of brokers with account holders who are Company stockholders will be “householding” the Company’s proxy materials. A single Notice of Internet Availability of Proxy Materials will be delivered to multiple stockholders sharing an address unless contrary instructions have been received from the affected stockholders. Once you have received notice from your broker that they will be “householding” communications to your address, “householding” will continue until you are notified otherwise or until you revoke your consent. If, at any time, you no longer wish to participate in “householding” and would prefer to receive a separate Notice of Internet Availability of Proxy Materials, please notify your broker or the Company by telephone at (415) 655-4168 or by written request to 611 Gateway Boulevard, Suite 740, South San Francisco, California 94080, Attention: Corporate Secretary, and we will promptly deliver the requested documents or notice. Stockholders who currently receive multiple copies of the Notices of Internet Availability of Proxy Materials at their addresses and would like to request “householding” of their communications should contact their brokers.

OTHER MATTERS

The Board knows of no other matters that will be presented for consideration at the Annual Meeting. If any other matters are properly brought before the meeting, it is the intention of the persons named in the accompanying proxy to vote on such matters in accordance with their best judgment.

**CERTIFICATE OF AMENDMENT
TO AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
SPRUCE BIOSCIENCES, INC.**

[_____], 2025

Spruce Biosciences, Inc., a corporation organized and existing under the laws of the State of Delaware (the “*Corporation*”), DOES HEREBY CERTIFY AS FOLLOWS:

1. The name of the corporation is “Spruce Biosciences, Inc.” The original certificate of incorporation was filed with the Secretary of State of the State of Delaware on April 7, 2016 (as amended on October 14, 2020, the “*Certificate of Incorporation*”).
2. Article IV, Part A of the Certificate of Incorporation of the Corporation is amended and restated in its entirety to read as follows:

“Authorized Capital Stock. The total number of shares of all classes of capital stock which the Corporation is authorized to issue is 210,000,000 shares, consisting of (a) 200,000,000 shares of common stock, par value \$0.0001 per share (the “**Common Stock**”) and (b) 10,000,000 shares of preferred stock, par value \$0.0001 per share (the “**Preferred Stock**”).

Effective as of 5:00 pm Eastern time, on the date this Certificate of Amendment to this Second Amended and Restated Certificate of Incorporation is filed with the Secretary of State of the State of Delaware (the “**Effective Time**”), each [_____]⁴ shares of the Company’s Common Stock, par value \$0.0001 per share, issued and outstanding shall automatically and without any action on the part of the respective holders thereof, be combined and converted into one share of Common Stock without increasing or decreasing the par value of each share of Common Stock. No fractional shares shall be issued and, in lieu thereof, any holder of less than one share of Common Stock shall, upon surrender after the Effective Time of a certificate, which formerly represented shares of Common Stock that were issued and outstanding immediately prior to the Effective Time, be entitled to receive cash for such holder’s fractional share based upon the closing sales price of the Corporation’s Common Stock on the date this Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Corporation is filed with the Secretary of State of the State of Delaware.”
3. The foregoing amendment to the Certificate of Incorporation was duly approved by the Board.
4. Thereafter, pursuant to a resolution of the Board, this Certificate of Amendment was submitted to the stockholders of the Corporation for their approval, and was duly adopted and approved in accordance with the provisions of Section 242 of the Delaware General Corporation Law.

[SIGNATURE PAGE FOLLOWS]

4 The stockholders are requested to adopt an amendment approving the combination of any whole number of shares of the Corporation’s Common Stock at any ratio between 5:1 and 30:1. By approving Proposal No. 3, stockholders are approving each whole number between 5 and 30 proposed by the Corporation’s Board of Directors for the ratio. If the reverse stock split proposal is approved by stockholders, the Certificate of Amendment filed with the Secretary of State of the State of Delaware will include only that reverse stock split ratio determined by the Corporation’s Board of Directors to be in the best interests of the Corporation and its stockholders. The other amendments will be abandoned pursuant to Section 242(c) of the General Corporation Law of the State of Delaware. The Corporation’s Board of Directors may also elect not to effect any reverse stock split, in which case all proposed alternate amendments will be abandoned.

IN WITNESS WHEREOF, Spruce Biosciences, Inc. has caused this Certificate of Amendment to be duly executed and acknowledged in its name and on behalf by an authorized officer of the date first set forth above.

SPRUCE BIOSCIENCES, INC.

By: _____
Name: Javier Szwarcberg, M.D., MPH
Title: Chief Executive Officer

A copy of the Annual Report is available without charge upon written request to 611 Gateway Boulevard, Suite 740 South San Francisco, California 94080 Attention: Corporate Secretary.

By Order of the Board of Directors

A handwritten signature in black ink, appearing to read "J. Szwarcberg", with a long horizontal flourish underneath.

Javier Szwarcberg, M.D., MPH

Chief Executive Officer

April 28, 2025



SPRUCE BIOSCIENCES, INC.
611 GATEWAY BOULEVARD, SUITE 740
SOUTH SAN FRANCISCO, CA 94080



SCAN TO
VIEW MATERIALS & VOTE



VOTE BY INTERNET

Before The Meeting - Go to www.proxyvote.com or scan the QR Barcode above

Use the Internet to transmit your voting instructions and for electronic delivery of information. Vote by 11:59 p.m. Eastern Time on June 8, 2025. Have your proxy card in hand when you access the web site and follow the instructions to obtain your records and to create an electronic voting instruction form.

During The Meeting - Go to www.virtualshareholdmeeting.com/SPRB2025

You may attend the meeting via the Internet and vote during the meeting. Have the information that is printed in the box marked by the arrow available and follow the instructions.

VOTE BY PHONE - 1-800-690-6903

Use any touch-tone telephone to transmit your voting instructions. Vote by 11:59 p.m. Eastern Time on June 8, 2025. Have your proxy card in hand when you call and then follow the instructions.

VOTE BY MAIL

Mark, sign and date your proxy card and return it in the postage-paid envelope we have provided or return it to Vote Processing, c/o Broadridge, 51 Mercedes Way, Edgewood, NY 11717.

TO VOTE, MARK BLOCKS BELOW IN BLUE OR BLACK INK AS FOLLOWS:

V74237-F30195

KEEP THIS PORTION FOR YOUR RECORDS
DETACH AND RETURN THIS PORTION ONLY

THIS PROXY CARD IS VALID ONLY WHEN SIGNED AND DATED.

<p>SPRUCE BIOSCIENCES, INC.</p> <p>The Board of Directors recommends you vote FOR ALL of the following nominees nominated by the Board of Directors:</p> <p>1. To elect the three Class II directors named below to hold office until the Company's 2028 annual meeting of stockholders.</p> <p>Nominees:</p> <p>01) Petchval Barretto-Ko 02) Ball Muralikhar, M.D., Ph.D. 03) Daniel Spiegelman</p>		<p>For All</p> <p>Withhold All</p> <p>For All Except</p>	<p>To withhold authority to vote for any individual nominee(s), mark "For All Except" and write the number(s) of the nominee(s) on the line below.</p> <p>_____</p>
<p>The Board of Directors recommends you vote FOR proposals 2, 3 and 4, proposed by the Board of Directors:</p> <p>2. To ratify the selection by the Audit Committee of the Board of Directors (the "Board") of BDO USA, P.C. as the independent registered public accounting firm of the Company for the Company's fiscal year ending December 31, 2025.</p> <p>3. To approve an amendment to the Company's Amended and Restated Certificate of Incorporation to effect a reverse stock split (the "Reverse Stock Split") of the Company's common stock by a ratio of between one-for-five and one-for-thirty, with the exact ratio to be determined by the board in its sole discretion and with such Reverse Stock Split to be effected at such time and date, if at all, as determined by the Board in its sole discretion.</p> <p>4. To approve the adjournment of the Annual Meeting, if necessary, to solicit additional proxies if there are not sufficient votes in favor of Proposal 3.</p>		<p>For</p> <p>Against</p> <p>Abstain</p>	<p>NOTE: In their discretion, the proxies are authorized to vote upon such other business as may properly come before the meeting or any adjournments or postponements thereof.</p>
<p>Please sign exactly as your name(s) appear(s) hereon. When signing as attorney, executor, administrator, or other fiduciary, please give full title as such. Joint owners should each sign personally. All holders must sign. If a corporation or partnership, please sign in full corporate or partnership name by authorized officer.</p>			
<p>Signature [PLEASE SIGN WITHIN BOX]</p>	<p>Date</p>	<p>Signature (Joint Owners)</p>	<p>Date</p>

**Important Notice Regarding the Availability of Proxy Materials for the Annual Meeting of Stockholders
to Be Held on June 9, 2025 at 10:00 AM (Pacific Time):**

The Proxy Statement and Annual Report to Stockholders are available at www.proxyvote.com.

V74238-F30195

**SPRUCE BIOSCIENCES, INC.
Annual Meeting of Stockholders
June 9, 2025 10:00 AM Pacific Time
This proxy is solicited by the Board of Directors**

The stockholder(s) hereby appoint(s) Javier Szwarcberg, Chief Executive Officer and Samir Gharib, President and Chief Financial Officer, or either of them, as proxies, each with the power to appoint his substitute, and hereby authorize(s) them to represent and to vote, as designated on the reverse side of this ballot, all of the shares of Common Stock of SPRUCE BIOSCIENCES, INC. that the stockholder(s) is/are entitled to vote at the Annual Meeting of Stockholders to be held at 10:00 AM, Pacific Time on June 9, 2025, at the Virtual Stockholder Meeting at www.virtualshareholdermeeting.com/SPRB2025 and any adjournment or postponement thereof.

This proxy, when properly executed, will be voted in the manner directed herein. If no such direction is made, this proxy will be voted in accordance with the Board of Directors' recommendations.

Continued and to be signed on reverse side

