
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

X4 Pharmaceuticals, Inc.

(Name of Registrant as Specified In Its Charter)

(Name of Person(s) Filing Proxy Statement if Other Than the Registrant)

Payment of filing Fee (Check the appropriate box):

- No fee required.
 - Fee paid previously with preliminary materials.
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X4 PHARMACEUTICALS, INC.
61 North Beacon Street, 4th Floor
Boston, Massachusetts 02134

NOTICE OF ANNUAL MEETING OF STOCKHOLDERS

To Be Held On June 13, 2023

Dear Stockholder of X4 Pharmaceuticals, Inc.:

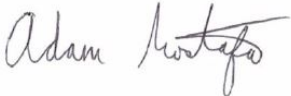
You are cordially invited to attend the 2023 Annual Meeting of Stockholders of X4 Pharmaceuticals, Inc., a Delaware corporation (the "Company"). The Annual Meeting will be held on Tuesday, June 13, 2023 at 12:00 p.m. Eastern Time at the offices of Cooley LLP, 500 Boylston Street, 14th Floor, Boston, Massachusetts 02116. The Annual Meeting will be held for the following purposes:

1. To elect the three (3) nominees named in the accompanying proxy statement (the "Proxy Statement"), Gary J. Bridger, Ph.D., Francoise de Craecker and Murray W. Stewart, M.D., to the Board of Directors to hold office until the 2026 Annual Meeting of Stockholders and until their successors are duly elected and qualified.
2. To ratify the selection by the Audit Committee of the Board of Directors of PricewaterhouseCoopers LLP as the independent registered public accounting firm of the Company for its fiscal year ending December 31, 2023.
3. To hold an advisory "say-on-pay" vote on our executive compensation.
4. To hold an advisory vote on the frequency of future advisory votes on executive compensation ("say-on-frequency").
5. To approve the Company's Amended and Restated 2017 Employee Stock Purchase Plan.
6. 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 record date for the Annual Meeting is April 18, 2023. Only stockholders of record at the close of business on that date may vote at the Annual Meeting or any adjournment or postponement thereof. A list of stockholders entitled to vote at the Annual Meeting will be available at our principal executive offices for examination during normal business hours by any stockholder for any purpose germane to the Annual Meeting for a period of ten days ending the day prior to the Annual Meeting.

By Order of the Board of Directors,



Adam Mostafa
Chief Financial Officer, Treasurer and Corporate
Secretary

Boston, Massachusetts
April 25, 2023

You are cordially invited to attend the Annual Meeting. Whether or not you expect to attend the Annual Meeting, please vote by telephone or through the Internet, or, if you receive a paper proxy card by mail, by completing and returning the proxy card mailed to you, 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 and included in the accompanying Proxy Statement. Even if you have voted by proxy, you may still vote in person if you attend the Annual Meeting. Please note, however, that if your shares are held of record by a brokerage firm, bank or other agent and you wish to vote at the Annual Meeting, you must obtain a proxy issued in your name from that agent in order to vote your shares that are held in such agent's name and account.

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**X4 PHARMACEUTICALS, INC.
61 North Beacon Street, 4th Floor
Boston, Massachusetts 02134**

**PROXY STATEMENT
FOR THE 2023 ANNUAL MEETING OF STOCKHOLDERS**

June 13, 2023

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 X4 Pharmaceuticals, Inc. (sometimes referred to as the “Company” or “X4”) is soliciting your proxy to vote at the 2023 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 mail the Notice on or about April 25, 2023 to all stockholders of record entitled to vote at the Annual Meeting.

Will I receive any other proxy materials by mail?

We may elect, in our discretion, to send you a proxy card, along with a second Notice, on or after ten calendar days have passed since our first mailing of the Notice.

How do I attend the Annual Meeting?

The Annual Meeting will be held in person on Tuesday, June 13, 2023 at 12:00 p.m. Eastern Time at the offices of Cooley LLP, 500 Boylston Street, 14th Floor, Boston, Massachusetts 02116. Directions to the Annual Meeting may be found at <http://www.proxydocs.com/XFOR>. Information on how to vote in person at the Annual Meeting is discussed below.

What are the health and safety protocols to attend the Annual Meeting?

We are mindful of the public health concerns that may be posed by COVID-19. In-person attendance will require compliance with protocols consistent with then applicable federal, state and local guidelines, mandates or recommendations, as well as with requirements imposed by 500 Boylston building including potential restrictions on attendance for individuals who have symptoms of or have been exposed to COVID-19, for the protection of the other attendees. To ensure the continued safety of all, once the Annual Meeting has concluded, attendees maybe asked to leave the premises as soon as possible. These measures are subject to change due to the fluidity of the public health situation, and we reserve the right to make adjustments, take any additional precautionary measures or impose any additional procedures or limitations on meeting attendees as we deem appropriate in relation to the physical meeting and access.

Who can vote at the Annual Meeting?

Only stockholders of record at the close of business on April 18, 2023 will be entitled to vote at the Annual Meeting. On this record date, there were 121,207,488 shares of common stock outstanding and entitled to vote. A list of stockholders entitled to vote at the Annual Meeting will be available at our principal executive offices for examination during normal business hours by any stockholder for any purpose germane to the Annual Meeting for a period of ten days ending the day prior to the Annual Meeting.

Stockholder of Record: Shares Registered in Your Name

If on April 18, 2023, your shares were registered directly in your name with our transfer agent, Computershare Trust Company, N.A., then you are a stockholder of record. As a stockholder of record, you may vote in person at the Annual Meeting or vote by proxy prior to the Annual Meeting. Whether or not you plan to attend the Annual Meeting, we urge you to

vote by proxy electronically through the Internet, over the telephone or by completing and returning a printed proxy card that you may request or that we may elect to deliver at a later time to ensure your vote is counted.

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

If on April 18, 2023, 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. However, since you are not the stockholder of record, you may not vote your shares in person at the Annual Meeting unless you request and obtain a valid proxy from your broker, bank or other agent.

What am I voting on?

There are five matters scheduled for a vote:

- Election of three (3) directors to hold office until the 2026 Annual Meeting of Stockholders (Proposal 1);
- Ratification of selection by the Audit Committee of the Board of Directors of PricewaterhouseCoopers LLP as our independent registered public accounting firm for our fiscal year ending December 31, 2023 (Proposal 2);
- Advisory “say-on-pay” vote on our executive compensation (Proposal 3);
- Advisory “say-on-frequency” vote (Proposal 4); and
- Approval of Amended and Restated 2017 Employee Stock Purchase Plan (Proposal 5).

What if another matter is properly brought before the Annual 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 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?

With respect to Proposal 1, you may either vote “FOR” all the nominees to the Board or you may “WITHHOLD” your vote for any nominee you specify. With respect to Proposals 2, 3, and 5, you may vote “FOR” or “AGAINST” or abstain from voting. With respect to Proposal 4, you may vote “ONE YEAR,” “TWO YEARS,” “THREE YEARS,” or abstain from voting.

The procedures for voting are as follows:

Stockholder of Record: Shares Registered in Your Name

If you are a stockholder of record, you may vote in person at the Annual Meeting, vote by proxy through the Internet, vote by proxy over the telephone, or vote by proxy using a proxy card that you may request or that we may elect to deliver at a later time. Whether or not you plan to attend the Annual Meeting, we urge you to vote by proxy to ensure your vote is counted. You may still attend the Annual Meeting and vote in person even if you have already voted by proxy.

- To vote in person, come to the Annual Meeting and we will give you a ballot when you arrive.
- To vote through the Internet before the Annual Meeting, go to www.proxyvote.com to complete an electronic proxy card. You will be asked to provide the 16-digit control number from the Notice. Your Internet vote must be received by 11:59 p.m., Eastern Time, on June 12, 2023 to be counted.
- To vote over the telephone from a location in the United States, dial toll-free 1-800-690-6903 using a touch-tone phone and follow the recorded instructions. You will be asked to provide the control number from the Notice. Your telephone vote must be received by 11:59 p.m., Eastern Time, on June 12, 2023 to be counted.

- To vote by using a printed proxy card that may be delivered to you, simply complete, sign and date the proxy card 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.

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 us. Simply follow the voting instructions in the Notice to ensure that your vote is counted. To vote in person at the Annual Meeting, you must obtain a valid proxy from your broker, bank or other agent. Follow the instructions from your broker, bank or other agent included with these proxy materials, or contact that organization to request a proxy form.

We provide Internet proxy voting 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, such as usage charges from internet access providers and telephone companies.

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 April 18, 2023.

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 a proxy card, by telephone, through the Internet or in person 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 of our independent registered public accounting firm, “FOR” the advisory vote on “say-on-pay”, “ONE YEAR” for the advisory vote on “say-on-frequency” and “FOR” the approval of Amended and Restated 2017 Employee Stock Purchase Plan. If any other matter is properly presented at the Annual Meeting, your proxyholder (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. In this regard, each of Proposals 1, 3, 4 and 5 is considered to be “non-routine” under NYSE rules meaning that your broker may not vote your shares on this proposal in the absence of your voting instructions. However, Proposal 2 is considered to be a “routine” matter 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. Accordingly, if you own shares through a nominee, such as a broker, bank or other agent, please be sure to instruct your nominee how to vote to ensure that your vote is counted on all of the proposals.

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 each of 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 (which automatically revokes the earlier proxy).
- You may grant a subsequent proxy by telephone or through the Internet.
- You may send a timely written notice that you are revoking your proxy to our Corporate Secretary at 61 North Beacon Street, 4th Floor, Boston, Massachusetts 02134.
- You may attend the Annual Meeting and vote in person. 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.

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 27, 2023, to our Corporate Secretary, c/o X4 Pharmaceuticals, Inc., 61 North Beacon Street, 4th Floor, Boston, Massachusetts 02134.

Our bylaws also establish an advance notice procedure if you wish to present a proposal (including a director nomination) before an annual meeting of stockholders but you are not requesting that your proposal or nomination be included in next year's proxy materials. To be timely for our 2024 Annual Meeting of Stockholders, our Corporate Secretary must receive the written notice at our principal executive offices not later than the close of business on March 15, 2024 nor earlier than the close of business on February 14, 2024. However, if we hold our 2024 Annual Meeting of Stockholders more than 30 days before or after June 13, 2024 (the one-year anniversary date of the 2023 Annual Meeting of Stockholders), then timely notice of a stockholder proposal that is not intended to be included in our proxy statement must be received not earlier than the close of business on the 120th day prior to the 2024 Annual Meeting of Stockholders and not later than the close of business on the later of (a) the 90th day prior to the 2024 Annual Meeting of Stockholders and (b) the 10th day following the day on which the one of the following first occurs: (i) mailing of notice of the date of the 2024 Annual Meeting of Stockholders and (ii) the first public announcement of the date of the 2024 Annual Meeting of Stockholders. You are also advised to review our bylaws, which contain additional requirements about advance notice of stockholder proposals and director nominations. 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).

How are votes counted?

Votes will be counted by the inspector of election appointed for the Annual Meeting, who will separately count, for the proposal to elect directors (Proposal 1), votes "For," "Withhold" and broker non-vote, with respect to Proposals 2, 3 and 5, votes "For," "Against" abstentions, and with respect to Proposal 4, votes "One Year," "Two Years," "Three Years" and

abstentions, and, if applicable, broker non-votes. Abstentions will be counted towards the vote total for Proposals 2, 3, 4 and 5 and will have the same effect as “Against” votes. Broker non-votes on Proposals 1, 3, 4 and 5 will have no effect and will not be counted towards the vote total for any of those proposals.

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. These unvoted shares are counted as “broker non-votes.” Each of Proposals 1, 3, 4 and 5 is considered to be “non-routine” under NYSE rules and we therefore expect broker non-votes to exist in connection with that proposal.

*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 approve each proposal?

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	Effect of Abstentions	Effect of Broker Non-Votes
1	Election of directors	The three nominees receiving the most “ FOR ” votes from the holders of shares, either present at the meeting or represented by proxy, and entitled to vote on the election of directors will be elected; withheld votes will have no effect.	Not applicable	No effect
2	Ratification of the selection of PricewaterhouseCoopers LLP as our independent registered public accounting firm for the year ending December 31, 2023	“ FOR ” votes from the holders of shares representing a majority of the voting power of the shares of common stock of the Company, either present at the meeting or represented by proxy, and entitled to vote on the matter.	Against	Not applicable ⁽¹⁾
3	Advisory “say-on-pay” vote on executive compensation	“ FOR ” votes from the holders of shares representing a majority of the voting power of the shares of common stock of the Company, either present at the meeting or represented by proxy, and entitled to vote on the matter.	Against	No effect
4	Advisory vote on the frequency of future advisory votes on executive compensation (“say-on-frequency”)	“ ONE YEAR ,” “ TWO YEARS ” or “ THREE YEARS ” that receives the highest number of votes cast by stockholders will be the frequency for the advisory vote on executive compensation that has been selected by stockholders.	Against	No effect
5	Approval of the Company’s Amended and Restated 2017 Employee Stock Purchase Plan	“ FOR ” votes from the holders of shares representing a majority of the voting power of the shares of common stock of the Company, either present at the meeting or represented by proxy, and entitled to vote on the matter.	Against	No effect

⁽¹⁾ Proposal 2 is considered to be a “routine” matter under NYSE rules. Accordingly, if you hold your shares in street name and do not provide voting instructions to your broker, bank or other agent that holds your shares, your broker, bank or other agent has discretionary authority under NYSE rules to vote your shares on 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 in voting power of the outstanding shares entitled to vote are present at the Annual Meeting in person or represented by proxy. On the record date, there were 121,207,488 shares outstanding and entitled to vote. **Thus, the holders of 60,603,745 shares must be present in person 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 in person at the Annual Meeting. Abstentions and broker non-votes will be counted towards the quorum requirement. If there is no quorum, the holders of a majority of shares present at the Annual Meeting in person or represented by proxy may adjourn the Annual 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

Our 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 only 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 at our Annual Meeting: Gary J. Bridger, Ph.D., Francoise de Craecker and Murray W. Stewart, M.D. If elected at the Annual Meeting, each of these nominees would serve until the 2026 annual meeting and until his or her successor has been duly elected and qualified, or, if sooner, until the director's death, resignation or removal. It is our policy that all directors and nominees for director make every effort to attend the Annual Meeting. All of the then-serving directors attended the 2022 Annual Meeting of stockholders.

Vote Required

Directors are elected by a plurality of the votes of the holders of shares present in person or by remote communication, as applicable, 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. Shares represented by executed proxies will be voted, if authority to do so is not withheld, for the election of the three nominees named below. If any nominee becomes unavailable for election as a result of an unexpected occurrence, shares that would have been voted for that nominee will instead be voted for the election of a substitute nominee proposed by us. Each person nominated for election has agreed to serve if elected. We have no reason to believe that any nominee will be unable to serve.

Director Nominees and Continuing Directors

The following is a brief biography and the ages of each nominee and each director whose term will continue after the Annual Meeting, and a discussion of the specific experience, qualifications, attributes or skills of each nominee that led the Nominating and Corporate Governance Committee to recommend that person as a nominee for director, as of the date of this Proxy Statement.

There are no family relationships between or among any of our directors or nominees. There is no arrangement or understanding between any of our directors or nominees and any other person or persons pursuant to which he or she is to be selected as a director or nominee.

There are no legal proceedings to which any of our directors is a party adverse to us or any of our subsidiaries or in which any such person has a material interest adverse to us or any of our subsidiaries.

Nominees for Election as a Class III Director for a Three-Year Term Expiring at the 2026 Annual Meeting of Stockholders

Gary J. Bridger, Ph.D., age 60, became a member of the board of directors of X4 Pharmaceuticals, Inc., a private company, in October 2018 and continues to serve as a member of our Board following the completion of the Merger in March 2019. From February 2015 to December 2017, Dr. Bridger served as a consultant to Xenon Pharmaceuticals Inc., a biopharmaceutical company, where he previously served as the Executive Vice President of Research and Development from January 2013 to February 2015. From October 2013 to October 2015, Dr. Bridger served as a Managing Director at Five Corners Capital Inc. From June 2010 to June 2012, Dr. Bridger served as a venture partner at Venture West Capital Management, a venture capital firm. From November 2006 to December 2007, Dr. Bridger served as Senior Vice President of Research and Development of Genzyme Corporation, a biotechnology company, which was acquired by Sanofi, S.A. In June 1996, Dr. Bridger co-founded AnorMED Inc., a biopharmaceutical company, and was its Vice President of Research and Development and Chief Scientific Officer from 2000 until its acquisition by Genzyme in November 2006. Dr. Bridger has served on the board of directors of Liminal BioSciences Inc., a biotechnology company, since May 2019, and previously served on the board of directors of Alder BioPharmaceuticals, Inc., a biopharmaceutical company, from 2013 to 2016 and

Aquinox Pharmaceuticals Inc., a pharmaceuticals company, from 2015 until 2019. Dr. Bridger serves on the board of directors of Expansion Therapeutics and on the scientific advisory board of Alectos Therapeutics Inc., a biopharmaceutical company. Dr. Bridger holds a Ph.D. in Organic Chemistry from the University of Manchester Institute of Science and Technology. We believe that Dr. Bridger's experience as an executive officer or director of several public and private life sciences companies provides him with the qualifications and skills to serve on our Board.

Francoise de Craecker, age 61, has served as a member of our Board since October 14, 2021. Ms. de Craecker has served as an Independent Director of Gensight Biologics, a biopharma company focused on developing and commercializing innovative gene therapies for retinal neurodegenerative diseases and central nervous system disorders, since May 2021. Previously, from January 2018 to August 2019, Ms. de Craecker was the General Manager of the Europe, Middle East & Africa region at AveXis (now Novartis Gene Therapies), a biotechnology company that develops and commercializes gene therapies for rare and life-threatening neurological genetic disorders. From August 2014 to December 2017, Ms. de Craecker served as Senior Vice President and General Manager of the Europe, Middle East & Africa region at Raptor Pharmaceuticals, a biopharmaceutical company since acquired by Horizon Pharmaceuticals and after by Chiesi Farmaceutici. Earlier in her career, Ms. de Craecker held multiple positions of increasing responsibility and in diverse geographies at Shire Human Genetics Rare Disease Business Unit (previously Transkaryotic Therapies), from October 2000 to March 2014, including Vice President and General Manager of Europe, Vice President and General Manager of Northern Europe, Senior Director European Mid-Sized Countries and Global Fabry Disease Franchise Lead. Ms. de Craecker received her Masters in Nutrition Science from Faculty of Medicine of the University of Leuven (Belgium).

Murray W. Stewart, M.D., age 62, has served as a member of our Board since March 2019 and as our interim Chief Medical Officer since November 2022. Dr. Stewart has served as Chief Medical Officer of Rhythm Pharmaceuticals, Inc., a biopharmaceutical company focused on developing and commercializing therapies for the treatment of rare genetic disorders of obesity, since October 2018. He previously served as Head of Research and Development for Novilion Therapeutics Inc., a biopharmaceutical company focused on developing new standards of care for individuals living with rare disease, from November 2017 to October 2018. Prior to that, Dr. Stewart held various positions of increasing responsibility at GlaxoSmithKline, including serving as Chief Medical Officer from April 2014 to November 2017, with global responsibility for patient well-being across the vaccine, pharmaceutical, and consumer business units. He also held multiple research and development leadership roles, including Chief Medical Officer for the pharmaceutical business, Clinical Head of the Biopharma Unit, and Therapy Area Head for metabolic and cardiovascular diseases. Prior to his tenure to joining GlaxoSmithKline, he worked as a consultant physician and honorary senior lecturer at the Diabetes Center in Newcastle upon Tyne in the United Kingdom. Dr. Stewart holds an M.D. from Southampton Medical School and is a Fellow of the Royal College of Physicians. We believe that Dr. Stewart's extensive biopharmaceutical leadership experience, including experience in research, clinical development and regulatory strategy, provide him with the qualifications and skills to serve on our Board.

**THE BOARD OF DIRECTORS RECOMMENDS
A VOTE IN FAVOR OF EACH NAMED NOMINEE.**

Class I Directors Continuing in Office Until the 2024 Annual Meeting of Stockholders

David McGirr, M.B.A., age 68, became a member of the board of directors of Arsanis, Inc. in September 2017 and continues to serve as a member of our Board following the completion of the Merger in March 2019. From March 2013 until June 2014, Mr. McGirr was Senior Advisor to the chief executive officer of Cubist Pharmaceuticals, Inc., a biopharmaceutical company where he also served as Senior Vice President and Chief Financial Officer from November 2002 to March 2013. Prior to joining Cubist in 2002, Mr. McGirr was the President and Chief Operating Officer of Hippo Inc., a venture-financed internet technology company. From 1996 to 1999, he was the President of GAB Robins North America, Inc., a risk management company, serving also as Chief Executive Officer from 1997 to 1999. Mr. McGirr was a private equity investor from 1995 to 1996. From 1978 to 1995, Mr. McGirr served in various positions within the S.G. Warburg Group, ultimately as Chief Financial Officer, Chief Administrative Officer and Managing Director of S.G. Warburg & Co., Inc., a position held from 1992 to 1995. Mr. McGirr is currently a member of the board of directors of Insmid Incorporated, a publicly traded biopharmaceutical company, where he has served since October 2013, and Rhythm Pharmaceuticals, Inc., a publicly traded biopharmaceutical company, where he has served since November 2015. Mr. McGirr previously served on the board of

directors of Roka Bioscience, Inc., a molecular diagnostics company, from December 2013 to January 2018 and Menlo Therapeutics Inc., a publicly traded biopharmaceutical company, from November 2017 until its merger with Foamix Pharmaceuticals, Ltd., another publicly traded biopharmaceutical company, in March 2019. Mr. McGirr received a B.Sc. in Civil Engineering from the University of Glasgow and received an M.B.A. from The Wharton School at the University of Pennsylvania. We believe that Mr. McGirr's extensive experience with public and private pharmaceutical companies provides him with the qualifications and skills to serve on our Board.

Paula Ragan, Ph.D., age 53, has served as our President, Chief Executive Officer, Secretary and a member of our Board since July 2014. Prior to joining us, from August 2012 to September 2014, Dr. Ragan consulted as Chief Business Officer at Lysosomal Therapeutics Inc., a private biopharmaceutical company, where she led the company's business development activities. Prior to then, from January 2007 to August 2012, Dr. Ragan held leadership roles in corporate development and operations at Genzyme Corporation, a Sanofi company, where she led strategic partnering efforts for Genzyme's Rare Disease business and headed the supply chain planning for Genzyme's flagship commercial products. Other professional roles include business roles at Hydra Biosciences, Oscient Corporation and Celera Corporation. Dr. Ragan received her B.S. from Tufts University and her Ph.D. from Massachusetts Institute of Technology and completed post-doctoral studies at Harvard Medical School. We believe that Dr. Ragan's perspective and experience as our President and Chief Executive Officer, which provides the Board with historic knowledge, operational expertise and continuity, provides her with the qualifications and skills to serve on our Board.

Michael S. Wyzga, age 68, became a member of the board of directors of X4 Pharmaceuticals, Inc., a private company, in July 2018 and continues to serve as a member of our Board and our Chairman following the completion of the Merger in March 2019. Mr. Wyzga is currently the President of MSW Consulting Inc., a strategic consulting group focused in the life sciences area. From December 2011 until November 2013, Mr. Wyzga served as President and Chief Executive Officer and a member of the board of directors of Radius Health, Inc., a publicly traded biopharmaceutical company. Prior to that, Mr. Wyzga served in various senior management positions at Genzyme Corporation, a publicly traded global biotechnology company. Mr. Wyzga joined Genzyme in February 1998 and most recently served as Executive Vice President, Finance from May 2003 until November 2011 and as Chief Financial Officer from July 1999 until November 2011. Mr. Wyzga is also a member of the boards of directors of Exact Sciences Corporation, a publicly traded medical technology company, where he has served since February 2015; LogicBio Therapeutics, Inc., a publicly traded genetic medicines company, where he has served since September 2018; GenSight Biologics S.A., a Euronext traded biopharmaceutical company, where he has served since February 2016 and currently holds the position as Chairman of the Board of Directors; and Invivyd, Inc. a publicly traded biopharmaceutical company since June 2022 and currently holds the position of chair of the audit committee and member of the compensation committee. He previously served at Mereo BioPharma Group plc (formerly Oncomed Pharmaceuticals, Inc.), where he served from October 2013 through the business combination in April 2019 and Akebia Therapeutics, Inc., a publicly traded biopharmaceutical company, from February 2014 to December 2018. He received an M.B.A. from Providence College and a B.S. from Suffolk University. We believe that Mr. Wyzga's senior management experience at biopharmaceutical and biotechnology companies, his current and past experience on boards of directors of public companies, and his financial expertise qualify him to serve as a member of our Board.

Class II Directors Continuing in Office Until the 2025 Annual Meeting of Stockholders

William E. Aliski, MPA, age 74, has served as a member of our Board since September 2019. Since 2011, Mr. Aliski has served as an independent consultant to life sciences companies focused on orphan diseases. Prior to 2011, he served as Chief Commercial Officer for FoldRX Pharmaceuticals, an early stage company purchased by Pfizer in 2011, served as General Manager for Biomarin Europe, a biopharmaceutical company focused on rare diseases with genetic causes, and held executive level positions at Transkaryotic Therapies (TKT)/Shire and Genzyme Corp., both biopharmaceutical companies. Previously, Mr. Aliski served as a member of the boards of directors of Ultragenyx Pharmaceutical, Inc. from January 2011 until June 2022 and Applied Genetic Therapies Corporation from November 2018 until 2023. Mr. Aliski holds a M.P.A. from Harvard University and a Master of Social Planning from Boston College. We believe that Mr. Aliski's experience, in both consulting and operational roles, with life sciences companies focused on orphan diseases, as well as his public company board experience, qualify him to serve on our Board.

Alison Lawton, age 61, has served as a member of our Board since October 5, 2020. Ms. Lawton is an executive leader with more than 35 years of experience in biopharma and most recently served as the President and Chief Executive Officer of Kaleido Biosciences from August 2018 to June 2020, and prior to then as its President and Chief Operating Officer from

December 2017 to August 2018. Prior to joining Kaleido Biosciences, Ms. Lawton served as Chief Operating Officer at Aura Biosciences, Inc., an oncology therapeutics company, from January 2015 until December 2017, and, prior to joining Aura, served as a consultant to Aura from March 2014 to December 2014. Before that, Ms. Lawton served as Chief Operating Officer at OvaScience, Inc., a life sciences company, from January 2013 to January 2014. In addition, from 2014 to 2017, Ms. Lawton served as a biotech consultant for various companies, including as a part-time Chief Operating Officer consultant to the Company from 2014 to 2016. Prior to that, Ms. Lawton spent more than 20 years in various positions of increasing responsibility at Genzyme Corporation, a global biopharmaceutical company, and subsequently at Sanofi S.A., also a global biopharmaceutical company, following the acquisition of Genzyme by Sanofi in 2011. Ms. Lawton currently serves as a member of the board of directors of ProQR Therapeutics N.V., Aeglea Biotherapeutics, Magenta Therapeutics and three other nonpublic companies. Ms. Lawton previously served as a member of the board of directors of Verastem Inc., from 2012 to 2020, CoLucid Pharmaceuticals, Inc. from 2016 until its acquisition by Eli Lilly in 2017 and Cubist Pharmaceuticals until its acquisition by Merck & Co. She holds a B.Sc. in pharmacology from Kings College, University of London. We believe that Ms. Lawton's experience as a senior executive in the pharmaceutical and biotechnology industries qualify her to serve on our Board.

BOARD DIVERSITY

The Board Diversity Matrix below provides the diversity statistics for our Board.

Board Diversity Matrix (As of April 18, 2023)				
Total Number of Directors	8			
	Female	Male	Non-Binary	Did Not Disclose Gender
Part I: Gender Identity				
Directors	3	5	—	—
Part II: Demographic Background				
African American or Black	—	—	—	—
Alaskan Native or Native American	—	—	—	—
Asian	—	—	—	—
Hispanic or Latinx	—	—	—	—
Native Hawaiian or Pacific Islander	—	—	—	—
White	3	5	—	—
Two or More Races or Ethnicities	—	—	—	—
LGBTQ+	—			
Did Not Disclose Demographic Background	—			

INFORMATION REGARDING THE BOARD OF DIRECTORS AND CORPORATE GOVERNANCE

INDEPENDENCE OF THE BOARD OF DIRECTORS

As required under the Nasdaq Stock Market (“Nasdaq”) listing standards, 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 its 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 pertinent listing standards of Nasdaq, 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 the following five directors are independent directors within the meaning of the applicable Nasdaq listing standards: Mr. Aliski, Ms. de Craecker, Ms. Lawton, Mr. McGirr and Mr. Wyzga. 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. Each of Dr. Ragan and Dr. Stewart is employed by us and is therefore not independent under Nasdaq listing standards. Dr. Bridger has provided us with consulting services in the past pursuant to a consulting agreement described under “Transactions with Related Persons and Indemnification – Certain Related-Person Transactions.” The consulting agreement terminated in January 2023.

BOARD LEADERSHIP STRUCTURE

The Board has an independent Chairman, Mr. Wyzga, who has authority, among other things, to call and preside over Board meetings, including meetings of the independent directors, to set meeting agendas and to determine materials to be distributed to the Board. Accordingly, the Chairman has substantial ability to shape the work of the Board. We believe that separation of the positions of Chairman and Chief Executive Officer reinforces the independence of the Board in its oversight of our business and affairs. Our Board also recognizes the full-time, effort and energy that our Chief Executive Officer devotes to her position in the current business environment. In addition, we believe that having an independent Chairman creates an environment that is more conducive to objective evaluation, increasing management accountability and improving the ability of the Board to assess management’s capacity to act in the best interests of our Company and our stockholders. As a result, we believe that having an independent Chairman can enhance the effectiveness of the Board as a whole.

ROLE OF THE BOARD IN RISK OVERSIGHT

One of the Board’s key functions is informed oversight of our 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. For example, in determining whether and under what circumstances we will engage in financing transactions or enter into licensing, collaboration or similar arrangements, the Board is involved in our management of risks related to our financial condition or of the risks inherent in drug development and commercialization. As part of its oversight, our Board receives reports by each committee chair regarding the committee’s considerations and actions. In particular, the Audit Committee is responsible for discussing the adequacy of our risk management activities with management and our independent registered public accounting firm. The Audit Committee’s primary emphasis is managing our financial risk exposures, including our internal control over financial reporting. The Audit Committee also monitors compliance with legal and regulatory requirements and considers and approves or disapproves any related person transactions. In addition, the Compensation Committee is responsible for considering whether our compensation programs and practices are reasonably likely to have a material adverse effect on us. The Nominating and Corporate Governance Committee assists the Board by overseeing and evaluating programs and risks associated with Board organization, membership and structure, and corporate governance.

At each of its meetings, the Board receives business updates from various members of management. These updates may identify matters that have emerged within that member of management’s scope of responsibility that involve operational, financial, legal or regulatory risks and, in these cases, the Board provides guidance to management. Our Board believes that full and open communication between management and the Board is essential for effective risk management and oversight.

In carrying out their risk oversight functions, the Board and its committees routinely request and review management updates, reports from the independent auditors and legal and regulatory advice from outside experts, as appropriate, to assist in discerning and managing important risks that may be faced by us. The Board is committed to continuing to ensure and evolve its risk oversight practices as appropriate given the stage of our evolution as a late-stage clinical biopharmaceutical company and the fast-paced changes of the life sciences industry.

MEETINGS OF THE BOARD OF DIRECTORS

The Board met 15 times during the last fiscal year. Each of our incumbent Board members attended 75% or more of the aggregate number of meetings of the Board and of the committees on which he or she served, held during the portion of the last fiscal year for which he or she was a director or committee member.

INFORMATION REGARDING COMMITTEES OF THE BOARD OF DIRECTORS

The Board has three standing committees: an Audit Committee, a Compensation Committee and a Nominating and Corporate Governance Committee. Each of these committees has authority to engage legal counsel or other experts or consultants, as it deems appropriate to carry out its responsibilities. The composition and function of each of these committees are described below.

Audit Committee

The Audit Committee is currently composed of three members: Mr. McGirr (chair), Ms. Lawton and Mr. Wyzga. The Audit Committee met four times during 2022. The Board has adopted a written Audit Committee charter that is available to stockholders on our website at <http://investors.x4pharma.com/>.

The Audit Committee 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 our corporate accounting and financial reporting processes and audits of our financial statements. For this purpose, the Audit Committee performs several functions. The Audit Committee:

- appoints, evaluates, retains, and when necessary, terminates the engagement of the independent auditors;
- oversees the independent auditor and approves the compensation of the independence auditor;
- reviews and approves the retention of the independent auditors to perform any proposed permissible non-audit services;
- oversees the work of the independent auditor, including resolution of disagreements between our management and the independent auditor regarding financial reporting;
- reviews our annual audited financial statements and quarterly financial statements with management and the independent auditor, including our disclosures under “Management’s Discussion and Analysis of Financial Condition and Results of Operations;”
- discusses the type and presentation of information to be disclosed in our earnings releases;
- coordinates the Board’s oversight of our internal control over financial reporting, disclosure procedures, and code of business conduct and ethics;
- discusses our policies with respect to risk assessment and risk management, including guidelines and policies to govern the process by which our exposure to risk is handled;
- establishes procedures, as required under applicable law, for the receipt, retention and treatment of complaints received by us regarding accounting, internal accounting controls or auditing matters and the confidential and anonymous submission by employees of concerns regarding questionable accounting or auditing matters; and
- reviews our policies and procedures for reviewing and approving related person transactions.

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

The Board has also determined that each of Mr. McGirr and Mr. Wyzga qualifies as an “audit committee financial expert,” as defined in applicable Security and Exchange Commission (“SEC”) rules.

Report of the Audit Committee of the Board of Directors

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.

The Audit Committee has reviewed and discussed the audited financial statements for the fiscal year ended December 31, 2022 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 Company’s Annual Report on Form 10-K for the fiscal year ended December 31, 2022.

Respectfully submitted,

David McGirr, M.B.A (Chairman)
Alison Lawton
Michael S. Wyzga

Compensation Committee

The Compensation Committee is currently composed of three directors: Mr. Aliski (chair), Ms. de Craecker and Mr. Wyzga. All members of our Compensation Committee are independent (as independence is currently defined in Rule 5605(d)(2) of the Nasdaq Listing Rules.) The Compensation Committee met eight times during 2022. The Board has adopted a written Compensation Committee charter that is available to stockholders on our website at <http://investors.x4pharma.com>.

The Compensation Committee acts on behalf of the Board to review, approve or recommend for approval by the Board and oversee our compensation strategy, policies, plans and programs, including:

- review and approval, or review and recommendation to the Board for approval, the compensation and other terms of employment or service, including salary, bonus and incentive compensation levels, deferred compensation, executive perquisites, equity compensation, severance arrangements and change-in-control benefits, of our Chief Executive Officer and the other executive officers;
- oversight of the evaluation of our senior executives, including determining the nature and frequency of the evaluation and the persons subject to the evaluation, supervising the conduct of the evaluation, and preparing assessments of the senior executives’ performance;
- review and approval or review and recommendation to the Board of our incentive-compensation and equity-based plans and approval of any tax-qualified, non-discriminatory employee benefit plans for which stockholder approval is not sought and pursuant to which options or stock may be acquired by our officers, directors, employees or consultants;
- administration of our equity compensation plans; and
- review and recommendation to the Board with respect to director compensation.

Compensation Committee Processes and Procedures

In setting base salaries and bonuses and granting equity incentive awards for our executive officers, our Compensation Committee considers compensation for comparable positions in the market, the historical compensation levels of our executives, individual and corporate performance as compared to our expectations and objectives, our desire to motivate our employees to achieve short- and long-term results that are in the best interests of our stockholders, and a long-term commitment to our company. As part of this process, Dr. Ragan, as our president and chief executive officer, prepares performance evaluations for the other executive officers and recommends annual salary increases, annual equity awards and cash bonuses to the Compensation Committee. The Compensation Committee also conducts a performance evaluation of

Dr. Ragan. As necessary, the Compensation Committee consults with the Board as to the achievement of corporate objectives that drive contingent compensation awards.

We have utilized Arnosti Consulting, a compensation consultant with expertise in the biotechnology market to help assess executive and employee compensation and to help inform our compensation strategy.

Nominating and Corporate Governance Committee

The Nominating and Corporate Governance Committee is current composed of three directors: Mr. Aliski (chair), Mr. McGirr, and Mr. Wyzga. All members of the Nominating and Corporate Governance Committee are independent (as independence is currently defined in Rule 5605(a)(2) of the Nasdaq Listing Rules). The Nominating and Corporate Governance Committee met twice during 2022. The Board has adopted a written Nominating and Corporate Governance Committee charter that is available to our stockholders on our website at <http://investors.x4pharma.com/>.

The Nominating and Corporate Governance Committee of the Board is responsible for identifying, reviewing and evaluating candidates to serve as directors of the Company (consistent with criteria approved by the Board), reviewing and evaluating incumbent directors, recommending to the Board candidates for election to the Board, making recommendations to the Board regarding the membership of the committees of the Board (including with respect to making changes or rotation of members, the creation of additional Board committees, or changes in Committee charters), overseeing an annual self-assessment of the Board, overseeing succession planning for senior executives of the Company, and developing and recommending to the Board a set of corporate governance principles for the Company.

The Nominating and Corporate Governance Committee believes that candidates for director should have certain minimum qualifications, including a reputation for integrity, honesty and adherence to high ethical standards; demonstrated business acumen, experience and the ability to exercise sound judgements in matters that relate to the current and long-term objectives of the Company and a willingness and ability to contribute positively to the decision-making process of the Company; a commitment to understand the Company and its industry and to regularly attend and participate in meetings of the Board and its committees; the interest and ability to understand the sometimes conflicting interests of the various constituencies of the Company, which include stockholders, employees, customers, governmental units, creditors and the general public, and to act in the interests of all stockholders; and the ability to serve for at least three years before reaching the age of 75. The Nominating and Corporate Governance Committee also believes that candidates for director should not have, nor appear to have, a conflict of interest that would impair the candidate's ability to represent the interests of all the Company's stockholders and to fulfill the responsibilities of a director. However, the Nominating and Corporate Governance 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, and the Nominating and Corporate Governance Committee has direct input from the Chairman of the Board and the Chief Executive Officer.

Our Nominating and Corporate Governance Committee has not adopted a formal diversity policy in connection with the consideration of director nominations or the selection of nominees but believes that our Board, taken as a whole, should embody a diverse set of skills, experiences and backgrounds. In this regard, the Nominating and Corporate Governance Committee will consider issues of diversity among its members in identifying and considering nominees for director, and strive where appropriate to achieve a diverse balance of backgrounds, perspectives, experience, age, gender, ethnicity and country of citizenship on our Board and its committees. The Nominating and Corporate Governance Committee does not make any particular weighting of diversity or any other characteristic in evaluating nominees and directors.

The Nominating and Corporate Governance Committee appreciates the value of thoughtful Board refreshment, and regularly identifies and considers 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 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 and Corporate Governance Committee also takes into account the results of the Board's self-evaluation, conducted annually on a group and individual basis. In the case of new director candidates, the Nominating and Corporate Governance Committee also determines whether the nominee is independent for Nasdaq purposes, which determination is based upon applicable Nasdaq listing standards, applicable SEC rules and regulations and the advice of counsel, if necessary. The Nominating and Corporate Governance 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 and Corporate Governance 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 and Corporate Governance Committee meets to discuss and consider the candidates' qualifications and then selects a nominee for recommendation to the Board by majority vote.

The Nominating and Corporate Governance Committee will consider director candidates recommended by stockholders. The Nominating and Corporate Governance 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 and Corporate Governance Committee to become nominees for election to the Board may do so by delivering a written recommendation to the Nominating and Corporate Governance Committee at the following address: c/o X4 Pharmaceuticals, Inc., 61 North Beacon Street, 4th Floor, Boston, Massachusetts 02134 at least 120 days prior to the anniversary date of the mailing of our proxy statement for the last Annual Meeting of Stockholders. 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 our common stock and has been a holder for at least one year. 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.

STOCKHOLDER COMMUNICATIONS WITH THE BOARD OF DIRECTORS

These communications will be reviewed by one or more employees of the Company designated by the Board, who will determine whether the communication should be presented to the Board. Stockholders who wish to communicate with our Board, or any individual director, may do so by sending written communications addressed to our Corporate Secretary at 61 North Beacon Street, 4th Floor, Boston, Massachusetts 02134.

Communications will be distributed to the Board, or to any individual director or directors as appropriate, depending on the facts and circumstances outlined in the communications. Items that are unrelated to the duties and responsibilities of our Board of Directors may be excluded, such as:

- junk mail and mass mailings;
- resumes and other forms of job inquiries;
- surveys; and
- solicitations or advertisements.

In addition, any material that is unduly hostile, threatening, or illegal in nature may be excluded, in which case it will be made available to any outside director upon request.

CODE OF ETHICS

We have adopted a Code of Business Conduct and Ethics that applies to all of our officers, directors and employees. The Code of Business Conduct and Ethics is available on our website at <http://investors.x4pharma.com>. If the Company makes any substantive amendments to the Code of Business Conduct and Ethics or grants any waiver from a provision of the Code of Business Conduct and Ethics to any executive officer or director, the Company will promptly disclose the nature of the amendment or waiver on its website.

HEDGING POLICY

Our Board has adopted an insider trading policy, which prohibits our employees, directors and certain consultants from engaging in hedging or monetization transactions with respect to our securities, including through the use of financial instruments such as prepaid variable forwards, equity swaps, collars, and exchange funds. In addition, our insider trading policy prohibits trading in derivative securities related to our securities, which include publicly traded call and put options, engaging in short selling of our common stock, purchasing our common stock on margin or holding it in a margin account and pledging our shares as collateral for a loan.

PROPOSAL 2

RATIFICATION OF SELECTION OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Audit Committee of the Board has selected PricewaterhouseCoopers LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2023 and has further directed that management submit the selection of its independent registered public accounting firm for ratification by the stockholders at the Annual Meeting. PricewaterhouseCoopers LLP has audited our financial statements since 2016 and also served as our auditor when we were a private company since 2016. Representatives of PricewaterhouseCoopers LLP are expected to be 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 our Bylaws nor other governing documents or law require stockholder ratification of the selection of PricewaterhouseCoopers LLP as our independent registered public accounting firm. However, the Audit Committee of the Board is submitting the selection of PricewaterhouseCoopers LLP to the stockholders for ratification as a matter of good corporate practice. If the stockholders fail to ratify the selection, the Audit Committee of the Board will reconsider whether or not to retain that firm. Even if the selection is ratified, the Audit Committee of the Board 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 our best interests and our stockholders.

PRINCIPAL ACCOUNTANT FEES AND SERVICES

The following table represents aggregate fees billed to us for the fiscal years ended December 31, 2022 and December 31, 2021 by PricewaterhouseCoopers LLP, our principal accountant.

	For the year ended	
	2022	2021
Audit Fees ⁽¹⁾	\$ 960,000	\$ 758,000
Audit-related Fees ⁽²⁾	—	75,000
All Other Fees ⁽³⁾	4,038	2,125
Total Fees	\$ 964,038	\$ 835,125

(1) Consists of fees billed for professional services provided to us in connection with the annual audit of our consolidated financial statements, the review of our quarterly condensed consolidated financial statements, as well as audit services that are normally provided by an independent registered public accounting firm in connection with statutory and regulatory filings or engagements for those fiscal years, such as statutory audits. Included in 2022 and 2021 Audit Fees are fees of \$255,000 and \$183,000, respectively, in connection with the filing of registration statements and issuance of comfort letters.

(2) Consist of fees billed by an independent registered public accounting firm for assurance and related services that are reasonably related to the performance of the audit or review of financial statements and which are not reported under "Audit Fees." There were no such fees in 2022.

(3) Consists of subscription fees paid for access to online accounting research software applications and data.

All fees described above were pre-approved by the Audit Committee. There were no services that were approved by the Audit Committee pursuant to Rule 2-01(c)(7)(i)(C) (relating to the approval of a *de minimis* amount of non-audit services after the fact but before completion of the audit).

The Audit Committee has adopted a policy and procedures for the pre-approval of audit and non-audit services rendered by our independent registered public accounting firm, PricewaterhouseCoopers LLP. Prior to engagement of an independent registered public accounting firm for the next year's audit, management will submit an aggregate of services expected to be rendered during that year for each of four categories of services (audit services, audit-related services, tax services and other fees) to the Audit Committee for approval. Prior to engagement, the Audit Committee pre-approves these services by category of service. The fees are budgeted, and the Audit Committee requires our independent registered public accounting firm and management to report actual fees versus the budget periodically throughout the year by category of service. During the year, circumstances may arise when it may become necessary to engage our independent registered public accounting

firm for additional services not contemplated in the original pre-approval. In those instances, the Audit Committee requires specific pre-approval before engaging our independent registered public accounting firm. The pre-approval of services may be delegated to one or more of the Audit Committee's members, but the decision must be reported to the full Audit Committee at its next scheduled meeting.

The Audit Committee has determined that the rendering of services other than audit services by PricewaterhouseCoopers LLP is compatible with maintaining the principal accountant's independence.

Vote Required

The affirmative vote of the holders of shares representing a majority of the shares present in person or by proxy and entitled to vote on this matter at the Annual Meeting will be required to ratify the selection of PricewaterhouseCoopers LLP.

**THE BOARD OF DIRECTORS RECOMMENDS
A VOTE IN FAVOR OF PROPOSAL 2.**

PROPOSAL 3

NON-BINDING ADVISORY VOTE ON EXECUTIVE COMPENSATION

In accordance with the requirements of Section 14A of the Exchange Act (which was added by the Dodd-Frank Wall Street Reform and Consumer Protection Act (the “Dodd-Frank Act”)), we are providing our stockholders with an opportunity to make a non-binding advisory vote on the compensation of our named executive officers, as disclosed in this Proxy Statement.

This non-binding advisory vote is commonly known as a "say-on-pay" vote and provides our stockholders with the opportunity to express their views on our executive compensation for our named executive officers for fiscal year 2023.

We urge stockholders to read the “Executive Compensation” section of this proxy statement, which discusses our executive compensation policies and procedures and contains tabular information and narrative discussion about our executive compensation policies and procedures and the compensation of our named executive officers.

Advisory Vote and Board Recommendation

We request stockholder approval, on a non-binding and advisory basis, of the compensation of our named executive officers as disclosed in this Proxy Statement pursuant to the SEC's compensation disclosure rules (which disclosure includes the compensation tables and narrative disclosures that accompany the compensation tables within the Executive Compensation section of this Proxy Statement). This vote is not intended to address any specific element of compensation, but rather the overall compensation of our named executives and the compensation philosophy, policies, and practices described in this Proxy Statement. Accordingly, we ask our stockholders to vote “FOR” on the following resolution at the Annual Meeting:

"RESOLVED, that the Company's stockholders approve, on a non-binding and advisory basis, the compensation of the named executive officers, as disclosed in the Company's Proxy Statement for the 2023 Annual Meeting of Stockholders pursuant to the compensation disclosure rules of the Securities and Exchange Commission, including the Compensation Discussion and Analysis, the Summary Compensation Table, and the other related tables and disclosure within the Executive Compensation section of this Proxy Statement."

The say-on-pay vote is advisory, and therefore not binding on the corporation or our Board of Directors. This advisory resolution is non-binding on the Board of Directors. Although non-binding, our Board of Directors and the Committee value the opinions of our stockholders, and will carefully review and consider the voting results when making future decisions regarding our executive compensation program.

**THE BOARD OF DIRECTORS RECOMMENDS
A VOTE “FOR” ON PROPOSAL 3.**

PROPOSAL 4

NON-BINDING ADVISORY VOTE ON THE FREQUENCY OF AN ADVISORY VOTE ON EXECUTIVE COMPENSATION

In accordance with the requirements of Section 14A of the Exchange Act (which was added by the Dodd-Frank Act) and the related rules of the SEC, we are providing stockholders with a vote to approve, on an advisory basis, the frequency with which they believe a non-binding advisory vote regarding the compensation of our named executive officers, or “say-on-pay” vote, should occur. Stockholders may indicate whether they prefer we hold a say-on-pay vote every one year, every two years, or every three years, or they may abstain. This non-binding advisory vote is commonly known as a “say-on-frequency” vote. This say-on-frequency vote is required once every six years beginning with our 2023 annual meeting.

The Board of Directors has determined that the Company should hold a say-on-pay vote every year. An annual say-on-pay vote will allow us to obtain stockholder input on our executive compensation program on a more frequent basis, which aligns more closely with our objective to engage in regular dialogue with our stockholders on corporate governance matters, including our executive compensation philosophy, policies and practices. In addition, holding an annual say-on-pay vote provides the highest level of accountability and communication by enabling the say-on-pay vote to correspond with the most recent executive compensation information presented in our proxy statement for each annual stockholder meeting.

However, stockholders should note that because the advisory vote on executive compensation occurs well after the beginning of the compensation year, and because the different elements of our executive compensation programs are designed to operate in an integrated manner and to complement one another, in many cases it may not be appropriate or feasible to change our executive compensation program in consideration of any one year's advisory vote on executive compensation by the time of the following year's annual meeting of stockholders.

Advisory Vote and Board Recommendation

Stockholders are not voting to approve or disapprove the Board of Directors' recommendation. Instead, the proxy card provides stockholders with four choices with respect to this Proposal 4: one year, two years, three years or abstention from voting on this Proposal 4. We understand that our stockholders may have different views as to what is an appropriate frequency for advisory votes on executive compensation, and we will carefully review the voting results on this proposal. For the reasons discussed above, our Board of Directors is asking our stockholders to vote for a ONE YEAR frequency when voting at our 2023 annual meeting.

This advisory vote on the frequency of future advisory votes on executive compensation is non-binding on the Board of Directors. Notwithstanding the recommendation of the Board of Directors and the outcome of the shareholder vote, the Board of Directors may in the future decide to conduct advisory votes on a more or less frequent basis and may vary its practice based on factors such as discussions with share-holders and the adoption of material changes to compensation programs.

The affirmative vote of the majority of votes cast will constitute the stockholders' non-binding approval with respect to the frequency of future advisory votes on executive compensation. Because there are three choices, it is possible that none will obtain a majority. Abstentions and broker non-votes will have no effect on the outcome of this Proposal.

**THE BOARD OF DIRECTORS RECOMMENDS A VOTE
OF “ONE YEAR” ON PROPOSAL 4.**

PROPOSAL 5

APPROVAL OF AN AMENDMENT AND RESTATEMENT OF THE 2017 EMPLOYEE STOCK PURCHASE PLAN

The X4 Pharmaceuticals, Inc. 2017 Employee Stock Purchase Plan (the “2017 ESPP”) (formerly known as the Arsanis, Inc. 2017 Employee Stock Purchase Plan) was originally approved by our Board of Directors and our stockholders prior to the effectiveness of our initial public offering in 2017. On March 2, 2023 (the “Board Approval Date”), our Board of Directors approved the amendment and restatement of the 2017 ESPP (the “A&R ESPP”), subject to stockholder approval, which includes the following two amendments:

- Increase the number of shares of our common stock that may be issued under the A&R ESPP. As of the Board Approval Date, a total of 149,616 shares of our Common Stock remained available for issuance under the 2017 ESPP. These remaining shares would not be sufficient for continued purchases by our employees under the 2017 ESPP for the remainder of 2023. Subject to adjustment for certain changes in our capitalization, the proposed A&R ESPP will increase the aggregate number of shares available for issuance under the ESPP to 5,149,616 shares, which is an increase of 5,000,000 shares of Common Stock over the aggregate number of shares authorized and available for issuance under the 2017 ESPP as of the Board Approval Date.
- Eliminate the evergreen provision, which, under the 2017 ESPP, provided for an annual increase to the share reserve equal to the lower of (a) 2% of our outstanding shares of Common Stock, (b) 85,457 shares of Common Stock or (c) an amount designated by the Board of Directors (the “Evergreen Provision”).

Approval of the A&R ESPP will allow us to continue to provide our employees with the opportunity to acquire an ownership interest in the Company through their participation in the A&R ESPP, thereby encouraging them to remain in our service and more closely aligning their interests with those of our stockholders. The A&R ESPP became effective on March 2, 2023, the date it was adopted by our Board of Directors, and offerings under the A&R ESPP have commenced, but no purchase rights may be exercised under the A&R ESPP unless this Proposal 5 is approved by our stockholders.

As noted above, if this Proposal 5 is approved by our stockholders, then subject to adjustment for certain changes in our capitalization, the A&R ESPP will provide for an additional 5,000,000 shares of our Common Stock for awards under the A&R ESPP. We do not maintain any other employee stock purchase plans. As of April 18, 2023, a total of 122,207,488 shares of our Common Stock were outstanding.

If this Proposal 5 is approved by our stockholders, the A&R ESPP will become effective as of the date of the Annual Meeting. In the event that our stockholders do not approve this Proposal 5, the A&R ESPP will not become effective and the 2017 ESPP will continue in its current form until the current share pool is exhausted.

Summary of the A&R ESPP

The material features of the A&R ESPP are described below. The following description of the A&R ESPP is a summary only and is qualified in its entirety by reference to the complete text of the A&R ESPP. Stockholders are urged to read the actual text of the A&R ESPP in its entirety, which is attached hereto as Appendix A.

Purpose

The purpose of the A&R ESPP is to provide eligible employees of the company and certain of its subsidiaries with opportunities to purchase shares of our Common Stock, to assist us in retaining the services of our employees, to secure and retain the services of new employees and to provide incentives for such persons to exert maximum efforts for our success. The rights to purchase Common Stock granted under the A&R ESPP are intended to qualify as options issued under an “employee stock purchase plan” as that term is defined in Section 423(b) of the Internal Revenue Code.

Administration

The Board of Directors has the power to administer the A&R ESPP and may also delegate administration of the A&R ESPP to a committee comprised of one or more members of the Board of Directors. The Board of Directors has delegated administration of the A&R ESPP to the Compensation Committee, but may, at any time, revert in itself some or all of the powers previously delegated to the Compensation Committee. The Board of Directors and the Compensation Committee are each considered to be an ESPP Administrator for purposes of this Proposal 5. The ESPP Administrator has the final power to construe and interpret both the A&R ESPP and the rights granted under it. The ESPP Administrator has the power, subject to the provisions of the A&R ESPP, to determine when and how rights to purchase our Common Stock will be granted, the provisions of each offering of such rights (which need not be identical), and whether employees of any of our parent or subsidiary companies will be eligible to participate in the A&R ESPP.

Stock Subject to A&R ESPP

As of the Board Approval Date, only 149,619 shares of our Common Stock remained available for issuance under the 2017 ESPP. If this Proposal 5 is approved, the aggregate number of shares of our Common Stock that may be issued under the A&R ESPP will not exceed the sum of the following, subject to adjustment for certain changes in our capitalization:

- 149,619 shares authorized and available for issuance under the 2017 ESPP as of the Board Approval Date; plus
- an additional 5,000,000 shares of Common Stock.

If any rights granted under the A&R ESPP terminate without being exercised in full, the shares of Common Stock not purchased under such rights again become available for issuance under the A&R ESPP. The shares of Common Stock issuable under the A&R ESPP will be shares of authorized but unissued or reacquired Common Stock, including shares repurchased by us on the open market.

Offerings

The A&R ESPP will be implemented by offerings of rights to purchase our Common Stock to all eligible employees. The ESPP Administrator will determine the duration of each offering period, provided that in no event may an offering period exceed 12 months. Offerings will begin at such time and on such dates as the ESPP Administrator shall determine or on the first business day thereafter. Each offering will begin a six-month “plan period” during which payroll deductions will be made and held for the purchase of common stock at the end of the plan period. The ESPP Administrator may, at its discretion, choose a different plan period of not more than 12 months.

Eligibility

Any individual who is employed by us (or by any of our parent or subsidiary companies if such company is designated by the ESPP Administrator as eligible to participate in the A&R ESPP) may participate in offerings under the A&R ESPP, provided such individual has been:

- customarily employed by us or a designated subsidiary for more than 20 hours per week and for more than five months in a calendar year;
- been employed by us or a designated subsidiary for at least three months prior to enrolling in the plan; and
- employed by us or a designated subsidiary on the first day of the applicable plan period.

No employee will be eligible to participate in the A&R ESPP if, immediately after the grant of purchase rights, the employee would own, directly or indirectly, stock possessing 5% or more of the total combined voting power or value of all classes of our stock or of any of our parent or subsidiary companies, including any stock which such employee may purchase under all outstanding purchase rights and options. In addition, no employee may purchase more than \$25,000 worth of our Common Stock (determined based on the fair market value of the shares at the time such rights are granted) under all our employee stock purchase plans and any employee stock purchase plans of our parent or subsidiary companies for each calendar year during which such rights are outstanding. The ESPP Administrator retains the discretion to determine which eligible employees may participate in an offering pursuant to and consistent with Treasury Regulation Sections 1.423-2(e) and (f).

As of April 18, 2023, we had approximately 80 employees who were eligible to participate in the ESPP.

Participation in the A&R ESPP; Payment of Purchase Price; Payroll Deductions

Eligible employees may participate in an offering by enrolling at least 15 days prior to the applicable offering commencement date by completing and forwarding a written or electronic payroll deduction authorization form authorizing contributions which may not exceed the maximum amount specified by the ESPP Administrator, but in any case which may not exceed 15% of such employee’s earnings during the offering period. Each participant will be granted a separate purchase right for each offering in which he or she participates. Unless an employee’s participation is discontinued, his or her purchase right will be exercised automatically at the end of each purchase period at the applicable purchase price. The purchase of shares during an offering period generally will be funded by a participant’s payroll deductions accumulated during the offering period. A participant may change his or her rate of contributions, as determined by the ESPP Administrator in the offering. All contributions made for a participant are credited to his or her account under the A&R ESPP and deposited with our general funds.

Purchase Price

The purchase price per share at which shares of our Common Stock are sold on each purchase date during an offering period will not be less than the lower of the closing price of Common Stock on (i) the first business day of the plan period or (ii) the last business day of the plan period, or will be based solely on the closing price of our Common Stock on the last business

day of the plan period; provided, however, that such option price for each share purchased will be at least 85% of the applicable closing price. In the absence of a determination by the ESPP Administrator, the option price will be 85% of the lower of the closing price of our Common Stock on (1) the first business day of the plan period and (2) the last business day of the plan period. The closing price will be (a) the closing price (for the primary trading session) on any national securities exchange on which our Common Stock is listed or (b) the average of the closing bid and asked prices in the over-the-counter market, whichever is applicable, as published in The Wall Street Journal or another source selected by the ESPP Administrator. If no sales of our Common Stock were made on a date referred to above, the price of the Common Stock shall be the reported price for the next preceding day on which sales were made.

As of April 18, 2023, the closing price of our Common Stock as reported on The Nasdaq Capital Market was \$1.35 per share.

Purchase Limits

In connection with each offering made under the A&R ESPP, the ESPP Administrator may specify (i) a maximum number of shares of our Common Stock that may be purchased by any participant pursuant to such offering, (ii) a maximum number of shares of our Common Stock that may be purchased by any participant on any purchase date pursuant to such offering, (iii) a maximum aggregate number of shares of our Common Stock that may be purchased by all participants pursuant to such offering, and/or (iv) a maximum aggregate number of shares of our Common Stock that may be purchased by all participants on any purchase date pursuant to such offering. If the aggregate purchase of shares of our Common Stock issuable upon exercise of purchase rights granted under such offering would exceed any such maximum aggregate number, then the ESPP Administrator will make a pro rata allocation of available shares in a uniform and equitable manner. No purchase rights may be exercised under the A&R ESPP unless this Proposal 5 is approved by our stockholders.

Withdrawal

Participants may withdraw from a given offering by delivering a withdrawal form to us and terminating their contributions. Such withdrawal may be elected at any time prior to the close of business on the fifteenth business day prior to the end of a plan period and for any reason. Upon such withdrawal, we will distribute to the employee his or her accumulated but unused contributions without interest, and such employee's right to participate in that offering will terminate. However, an employee's withdrawal from an offering does not affect such employee's eligibility to participate in subsequent offerings under the A&R ESPP.

Termination of Employment

A participant's rights under any offering under the A&R ESPP will terminate immediately if the participant either (i) is no longer employed by us or any of our parent or subsidiary companies (subject to any post-employment participation period required by law) or (ii) is otherwise no longer eligible to participate. In such event, we will distribute to the participant his or her accumulated but unused contributions without interest.

Restrictions on Transfer

Rights granted under the A&R ESPP are not transferable except by will, by the laws of descent and distribution, or if permitted by us, by a beneficiary designation. During a participant's lifetime, such rights may only be exercised by the participant.

Changes in Capitalization

In the event of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification of shares, spin-off or other similar change in capitalization or event, or any dividend or distribution to holders of Common Stock other than an ordinary cash dividend, (i) the number and class of securities available under the plan, (ii) the share purchase limitations set forth in the plan, and (iii) the option price will be equitably adjusted to the extent determined by the ESPP Administrator.

Effect of Certain Reorganization Events

For purposes of the A&R ESPP, a reorganization event generally will be deemed to occur in the event of the consummation of: (i) any merger or consolidation of the Company with or into another entity as a result of which all of the Common Stock of the Company is converted into or exchanged for the right to receive cash, securities or other property or is cancelled, (ii) any transfer or disposition of all of the Common Stock of the Company for cash, securities or other property pursuant to a share exchange or other transaction or (iii) any liquidation or dissolution of the Company. In connection with a reorganization event, the ESPP Administrator may take any one or more of the following actions as to outstanding options on such terms as the ESPP Administrator determines:

- (a) provide that options will be assumed, or substantially equivalent options will be substituted, by the acquiring or succeeding corporation (or an affiliate thereof);
- (b) upon written notice to participants, provide that all outstanding options will be terminated immediately prior to the consummation of the reorganization event and that all such outstanding options will become exercisable to the extent of accumulated payroll deductions as of a date specified by the ESPP Administrator in such notice, which date shall not be less than 10 days preceding the effective date of the reorganization event;
- (c) upon written notice to participants, provide that all outstanding options will be cancelled as of a date prior to the effective date of the reorganization event and that all accumulated payroll deductions will be returned to participants on such date;
- (d) in the event of a reorganization event under the terms of which holders of our Common Stock will receive upon consummation of the event, a cash payment for each share surrendered in the reorganization event, referred to as the acquisition price, change the last day of the plan period to be the date of the consummation of the reorganization event and make or provide for a cash payment to each participant equal to (A) the acquisition price times the number of shares of our Common Stock that the participant's accumulated payroll deductions as of immediately prior to the reorganization event could purchase at the option price, where the acquisition price is treated as the fair market value of our Common Stock on the last day of the applicable plan period for purposes of determining the option price and where the number of shares that could be purchased is subject to the limitations set forth in that subsection, minus (B) the result of multiplying such number of shares by the option price;
- (e) provide that, in connection with our liquidation or dissolution, options will convert into the right to receive liquidation proceeds (net of the option price thereof); and
- (f) any combination of the foregoing.

For purposes of the foregoing, an option is considered to be assumed if, following the consummation of the reorganization event, the option confers the right to purchase, for each share of our Common Stock subject to the option immediately prior to the consummation of the reorganization event, the consideration (whether cash, securities, or other property) received as a result of the reorganization event by holders of our Common Stock for each share of our Common Stock held immediately prior to the consummation of a reorganization event (and if holders were offered a choice of consideration, the type of consideration chosen by the holders of a majority of the outstanding shares of Common Stock). However, if the consideration received as a result of a reorganization event is not solely common stock of the acquiring or succeeding corporation (or an affiliate thereof), we may, with the consent of the acquiring or succeeding corporation, provide for the consideration to be received upon the exercise of options to consist solely of such number of shares of common stock of the acquiring or succeeding corporation (or an affiliate thereof) that our board determines to be equivalent in value (as of the date of such determination or another date specified by our board) to the per share consideration received by holders of outstanding shares of our Common Stock as a result of a reorganization event.

Duration, Amendment and Termination

The A&R ESPP will remain in effect until terminated by the Board of Directors and may be amended or terminated at any time. However, except in regard to certain capitalization adjustments, any such amendment must be approved by our stockholders if such approval is required by applicable law or listing requirements.

Any outstanding purchase rights granted before an amendment or termination of the A&R ESPP will not be materially impaired by any such amendment or termination, except (i) with the consent of the participant to whom such purchase rights were granted, (ii) as necessary to comply with applicable laws, listing requirements or governmental regulations (including Section 423 of the Internal Revenue Code), or (iii) as necessary to obtain or maintain favorable tax, listing or regulatory treatment.

In the event of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification of shares, spin-off or other similar change in capitalization or event, or any dividend or distribution to holders of Common Stock other than an ordinary cash dividend, (i) the number and class of securities available under the plan, (ii) the share purchase

limitations set forth in the plan, and (iii) the option price will be equitably adjusted to the extent determined by the ESPP Administrator.

Federal Income Tax Information

The following is a summary of the principal United States federal income taxation consequences to participants and us with respect to participation in the A&R ESPP. This summary is not intended to be exhaustive and does not discuss the income tax laws of any local, state or foreign jurisdiction in which a participant may reside. The information is based upon current federal income tax rules and therefore is subject to change when those rules change. Because the tax consequences to any participant may depend on his or her particular situation, each participant should consult the participant's tax adviser regarding the federal, state, local, and other tax consequences of the grant or exercise of a purchase right or the sale or other disposition of Common Stock acquired under the A&R ESPP. The A&R ESPP is not qualified under the provisions of Section 401(a) of the Internal Revenue Code and is not subject to any of the provisions of ERISA.

Rights granted under the A&R ESPP are intended to qualify for favorable federal income tax treatment associated with rights granted under an employee stock purchase plan which qualifies under the provisions of Section 423 of the Internal Revenue Code.

A participant will be taxed on amounts withheld for the purchase of shares of our Common Stock as if such amounts were actually received. Otherwise, no income will be taxable to a participant as a result of the granting or exercise of a purchase right until a sale or other disposition of the acquired shares. The taxation upon such sale or other disposition will depend upon the holding period of the acquired shares.

If the shares are sold or otherwise disposed of more than two years after the beginning of the offering period and more than one year after the shares are transferred to the participant, then the lesser of the following will be treated as ordinary income: (i) the excess of the fair market value of the shares at the time of such sale or other disposition over the purchase price; or (ii) the excess of the fair market value of the shares as of the beginning of the offering period over the purchase price (determined as of the beginning of the offering period). Any further gain or any loss will be taxed as a long-term capital gain or loss.

If the shares are sold or otherwise disposed of before the expiration of either of the holding periods described above, then the excess of the fair market value of the shares on the purchase date over the purchase price will be treated as ordinary income at the time of such sale or other disposition. The balance of any gain will be treated as capital gain. Even if the shares are later sold or otherwise disposed of for less than its fair market value on the purchase date, the same amount of ordinary income is attributed to the participant, and a capital loss is recognized equal to the difference between the sales price and the fair market value of the shares on such purchase date. Any capital gain or loss will be short-term or long-term, depending on how long the shares have been held.

There are no federal income tax consequences to us by reason of the grant or exercise of rights under the A&R ESPP. We are entitled to a deduction to the extent amounts are taxed as ordinary income to a participant for shares sold or otherwise disposed of before the expiration of the holding periods described above (subject to the requirement of reasonableness and the satisfaction of tax reporting obligations).

New Plan Benefits under the A&R ESPP

Participation in the A&R ESPP is voluntary and each eligible employee will make his or her own decision regarding whether and to what extent to participate in the A&R ESPP. Accordingly, the benefits or amounts that will be received by or allocated to our executive officers and other employees under the A&R ESPP are not determinable. Our non-employee directors will not be eligible to participate in the A&R ESPP.

Name and Position	Number of Shares
Paula Ragan Ph.D. President and Chief Executive Officer	(1)
Adam S. Mostafa Chief Financial Officer, Treasurer and Secretary	(1)
Mary DiBiase Chief Operating Officer	(1)
All current executive officers as a group	(1)
All current directors who are not executive officers as a group	(2)
All current employees, including all current officers who are not executive officers, as a group	(1)

(1) Participation in the A&R ESPP is voluntary, and each eligible employee will make his or her own decision regarding whether and to what extent to participate in the A&R ESPP. However, our Board of Directors and Compensation Committee have granted purchase rights under the A&R ESPP that are subject to stockholder approval of this Proposal No. 5. The number of shares of our common stock that may be purchased pursuant to such purchase rights will depend in part on the fair market value of our common stock on the applicable purchase date and, therefore, is not determinable at this time. As of April 18, 2023, none of our executive officers, including our named executive officers, hold any such purchase rights and none have elected to participate in the A&R ESPP.

(2) Our non-employee directors are not eligible to participate in the A&R ESPP.

Plan Benefits under the A&R ESPP

The following table sets forth, for each of the individuals and various groups indicated, certain information regarding purchase rights that have been granted under the A&R ESPP as of April 18, 2023. A total of 277,108 common shares have been issued to the Company's employees under A&R ESPP to date.

Name and Position	Number of Shares
Paula Ragan, Ph.D. President and Chief Executive Officer	(1)
Adam S. Mostafa Chief Financial Officer, Treasurer and Secretary	(1)
Mary DiBiase Chief Operating Officer	(1)
All current executive officers as a group	(1)
All current directors who are not executive officers as a group	(2)
All current employees, including all current officers who are not executive officers, as a group	(1)
Each nominee for election as a director:	
Gary J. Bridger, Ph.D.	(2)
Francoise de Craecker	(2)
Murray Stewart, M.D.	(2)
Each associate of any executive officers, current directors or director nominees	(1)
Each other person who received or is to receive 5% of purchase rights	(1)
All current employees, including all current officers who are not executive officers, as a group	(1)

(1) As of April 18, 2023, no shares of our common stock have been purchased under the A&R ESPP, and no shares of our common stock may be purchased under the A&R ESPP unless this Proposal No. 5 is approved by our stockholders. Our Board of Directors and Compensation Committee have granted purchase rights under the A&R ESPP that are subject to stockholder approval of this Proposal No. 5. For more information regarding such purchase rights, please see footnote (1) to the table under "New Plan Benefits under A&R ESPP" above. As of April 18, 2023, our executive officers, including our named executive officers, do not hold any such purchase rights and have not elected to participate in the A&R ESPP.

(2) Our non-employee directors are not eligible to participate in the A&R ESPP.

VOTE REQUIRED

The affirmative vote of the holders of shares representing a majority of the shares present in person or represented by proxy and entitled to vote on this matter at the Annual Meeting will be required to approve the A&R ESPP.

**THE BOARD OF DIRECTORS RECOMMENDS
A VOTE IN FAVOR OF PROPOSAL 5.**

EXECUTIVE OFFICERS

The following table sets forth information with respect to our executive officers and their ages as of the date of this Proxy Statement. There are no family relationships between any of our executive officers, and there is no arrangement or understanding between any executive officer and any other person pursuant to which the executive officer was selected.

Name	Age	Position
Paula Ragan, Ph.D.	53	President, Chief Executive Officer and Director
Adam S. Mostafa	43	Chief Financial Officer, Treasurer and Corporate Secretary
Mary DiBiase, Ph.D.	62	Chief Operating Officer
Murray W. Stewart, M.D.	62	Interim Chief Medical Officer
Arthur Taveras, Ph.D.	59	Chief Scientific Officer
Mark Baldy	59	Chief Commercial Officer

Paula Ragan, Ph.D. Biographical information for Dr. Ragan is presented above under the caption “Class I Directors Continuing in Office Until the 2024 Annual Meeting of Stockholders”.

Adam S. Mostafa. Mr. Mostafa has served as our Chief Financial Officer and Treasurer since the Merger in March 2019 and has served as our Corporate Secretary since September 2022. Prior to the Merger, Mr. Mostafa served as Private X4’s Chief Financial Officer since September 2018. Prior to joining Private X4, Mr. Mostafa served as Chief Financial Officer of Abpro Corporation, a biotechnology company focused on antibody therapeutics, from June 2016 to August 2018. Prior to that, Mr. Mostafa was a managing director in the healthcare investment banking group at Cantor Fitzgerald from January 2015 to May 2016, and from June 2011 to January 2015, Mr. Mostafa was a senior banker in the healthcare investment banking group at Needham & Company. Prior to that, Mr. Mostafa was a vice president in the investment banking group at CRT Capital Group from March 2007 to May 2011, and from September 2003 to March 2007, Mr. Mostafa was a portfolio management associate in the global stock selection group at AQR Capital. Mr. Mostafa began his career as an analyst in the healthcare investment banking group at Salomon Smith Barney. Mr. Mostafa is currently a member of the board of directors of Satellos Bioscience, a publicly traded biotechnology company, where he has served since December 2021. Mr. Mostafa earned an A.B. in Economics from Brown University.

Mary DiBiase, Ph.D. Dr. DiBiase has served as our Chief Operating Officer since September 2021. Prior to her promotion, Dr. DiBiase served as our Senior Vice President and previously Vice President of Technical Operations and Quality from June 2017 to September 2021. From February 2013 to July 2016, Dr. DiBiase was VP Technical Operations and Program Management, previously VP Program Management at Epirus Biopharmaceuticals, a small biosimilar company working to expand access to biosimilar products across the globe. From June 2011 to May 2012, Dr. DiBiase served as VP Product Operations, Specialty Care Business Unit for Pfizer Global Supply. From 1995 to 2011, she held multiple positions of increasing responsibility at Biogen, including Sr Director CMC Management, Program Executive for Avonex[®] and Associate Director Pharmaceutical Science and Technology. Dr. DiBiase received her Ph.D. from University of Rhode Island and her B.Pharm. from the University of London.

Murray W. Stewart, M.D. Biographical information for Dr. Stewart is presented above under the caption “Nominees for Election as a Class III Director for a Three-Year Term Expiring at the 2026 Annual Meeting of Stockholders”.

Arthur Taveras, Ph.D. Dr. Taveras has served as our Chief Scientific Officer since November 2020. Previously, from August 2018 to July 2020, Dr. Taveras served as Chief Scientific Officer of Comet Therapeutics, Inc., a private biotechnology company. From May 2015 to the present, Dr. Taveras has served in various capacities as Chief Scientific Officer, Head of Drug Discovery and/or Owner of Transform Therapeutics, a private company he founded that is focused on developing novel therapeutics for cancer, neurodegenerative diseases and immunologic disorders. Dr. Taveras also served as President & Chief Scientific Officer of Shanghai ChemPartner Co., Ltd., a research organization serving the pharmaceutical and biotechnology industry, from October 2013 to December 2014. Earlier in his career, he held leadership positions at Biogen, Atlantos Pharmaceuticals (later acquired by Amgen), and Schering-Plough Research Institute (later acquired by Merck). Dr. Taveras received his Ph.D., M.S and B.S. degrees from Rensselaer Polytechnical Institute.

Mark Baldry. Mr. Baldry has served as our Chief Commercial Officer since November 2022. Previously, from November 2020 to October 2022, Mr. Baldry served as Chief Commercial Officer at Freeline Therapeutics Holdings Limited, a clinical-stage biotechnology company developing AAV gene therapies. From August 2019 to February 2020, Mr. Baldry served as Chief Commercial Officer of Wave Life Sciences USA, Inc., a clinical-stage genetic medicines company. From June 2015 to July 2019, Mr. Baldry held multiple positions of increasing responsibility at Amicus Therapeutics, Inc., a global biotechnology company focused on medicines for people living with rare metabolic diseases, including VP Global Marketing and SVP Global Marketing and Commercial Operations. Mr. Baldry received his B.Sc. in Genetics from York University (U.K.) and an M.B.A. from Concordia University (Canada).

**SECURITY OWNERSHIP OF
CERTAIN BENEFICIAL OWNERS AND MANAGEMENT**

The following table sets forth certain information regarding the ownership of the Company's common stock as of April 18, 2023 by: (i) each director and nominee for director; (ii) each of the executive officers named in the Summary Compensation Table; (iii) all current executive officers and directors of the Company as a group; and (iv) all those known by the Company to be beneficial owners of more than five percent of its common stock. Applicable percentages are based on 122,207,488 shares outstanding on April 18, 2023, adjusted as required by rules promulgated by the SEC. Unless otherwise noted below, the address of each stockholder below is c/o X4 Pharmaceuticals, Inc., 61 North Beacon Street, 4th Floor, Boston, Massachusetts 02134.

Beneficial Owner	Beneficial Ownership	
	Number of Shares	Percent of Total
5% Stockholders		
Entities affiliated with Bain Capital ⁽¹⁾	12,277,140	9.99 %
Entities affiliated with Growth Equity Opportunities 18 VGE, LLC ⁽²⁾	12,260,885	9.99 %
Entities affiliated with OrbiMed ⁽³⁾	10,328,649	8.15 %
Named Executive Officers, Directors and Director Nominees		
Paula Ragan, Ph.D. ⁽⁴⁾	736,892	*
Adam S. Mostafa ⁽⁵⁾	89,644	*
Mary DiBiase ⁽⁶⁾	131,223	*
William E. Aliski ⁽⁷⁾	19,614	*
Gary J. Bridger, Ph.D. ⁽⁸⁾	66,184	*
Francoise de Craecker ⁽⁹⁾	9,458	*
Alison Lawton ⁽¹⁰⁾	15,045	*
David McGirr, M.B.A. ⁽¹¹⁾	22,019	*
Murray W. Stewart, M.D. ⁽¹²⁾	28,503	*
Michael S. Wyzga ⁽¹³⁾	89,938	*
All directors and current executive officers as a group (12 people) ⁽¹⁴⁾	1,321,957	1.08 %

* Less than one percent.

(1) Based on a Schedule 13G/A filed by Bain Capital Life Sciences Fund, L.P. ("BCLS"), Bain Capital Life Sciences Fund II, L.P. ("BCLS II"), BCIP Life Sciences Associates, LP ("BCIP LS"), BCLS I Investco, LP ("BCLS I Investco") and BCLS II Investco, LP ("BCLS II Investco" and collectively, the "Bain Capital Holders") on February 14, 2023. As of the close of business on December 31, 2022, (i) BCLS held 566,966 shares of our common stock and pre-funded warrants to purchase 566,966 shares of our common stock; (ii) BCLS II held 1,332,276 shares of our common stock and pre-funded warrants to purchase 601,714 shares of our common stock; (iii) BCIP LS held 220,298 shares of our common stock and pre-funded warrants to purchase 131,320 shares of our common stock; (iv) BCLS II Investco held 6,948,620 shares of our common stock, warrants to purchase 6,448,689 shares of our common stock, Class C warrants to purchase 2,064,561 shares of common stock and pre-funded warrants to purchase 7,303,890 shares of common stock; and (v) BCLS I Investco held 2,522,176 shares of our common stock, warrants to purchase 2,688,998 shares of common stock, Class C warrants to purchase 860,888 shares of common stock and pre-funded warrants to purchase 1,888,599 shares of common stock. The Bain Capital Holders are (i) prohibited from exercising warrants to purchase common stock or pre-funded warrants to purchase common stock if, as a result of such exercise, the Bain Capital Holders would beneficially own more than 9.99% of the total number of shares of common stock then issued and outstanding immediately after giving effect to the exercise and (ii) prohibited from exercising Class C warrants to purchase common stock if, as a result of such exercise, the Bain Capital Holders would beneficially own more than 4.99% of the total number of shares of common stock then issued and outstanding immediately after giving effect to the exercise (collectively, the "Bain Beneficial Ownership Blockers"). As a result of the Bain Beneficial Ownership Blockers, the amount reported above as beneficially owned consists of: (a) an aggregate of 11,590,336 shares of common stock held by the Bain Capital Holders, (b) 566,966 shares of common stock issuable upon exercise of pre-funded warrants held by BCLS and (c) 119,838 shares of common stock issuable upon exercise of pre-funded warrants held by BCLS II. As a result of the Bain Beneficial Ownership Blockers, the following have been excluded from the amount reported above as beneficially owned: (a) 481,876 shares of common stock issuable upon exercise of pre-funded warrants held by BCLS II, (b) 131,320 shares of common stock issuable upon exercise of pre-funded warrants held by BCIP LS, (c) 1,888,599 shares of common stock issuable upon exercise of pre-funded warrants, 2,688,998 shares of common stock issuable upon exercise of warrants and 860,888 shares of common stock issuable upon exercise of Class C warrants held by BCLS I Investco, and (d) 7,303,890 shares of common stock issuable upon exercise of pre-funded warrants, 6,448,689 shares of common stock issuable upon exercise of warrants and 2,064,561 shares of common stock issuable upon exercise of Class C warrants held by BCLS II Investco. Bain Capital Life Sciences Investors, LLC, ("BCLSI"), whose managers are Jeffrey Schwartz and Adam Koppel, is (i) the general partner of Bain Capital Life Sciences Partners, LP, a Cayman exempted limited

partnership (“BCLSP”), which is the general partner of BCLS and (ii) the manager of Bain Capital Life Sciences Investors II, LLC (“BCLSI II”), which is the general partner of BCLS II. Boylston Coinvestors, LLC, a Delaware limited liability company (“Boylston”), is the general partner of BCIP LS. BCLSI governs the investment strategy and decision-making process with respect to investments held by BCIP LS. BCLS II Investco (GP), LLC, a Delaware limited liability company (“BCLS II Investco GP”), whose manager is BCLS II, is the general partner of BCLS II Investco, LP. As a result, each of BCLSI, Mr. Schwartz and Dr. Koppel may be deemed to share voting and dispositive power with respect to the securities held by the Bain Capital Holders. The address of each of the Bain Capital Holders, BCLSI, BCLSP, BCLS II, Boylston, BCLS I Investco LP, BCLS II Investco GP, Mr. Schwartz and Dr. Koppel is 200 Clarendon Street, Boston, MA 02116.

- (2) Based in part on a Schedule 13D/A filed by Growth Equity Opportunities 18 VGE, LLC (“GEO”) on December 19, 2022. In connection with our underwritten offering in December 2022, GEO purchased (i) 5,213,636 shares of our common stock, (ii) pre-funded warrants to purchase 6,150,000 shares of our common stock and (iii) Class C warrants to purchase 11,363,636 shares of common stock. The pre-funded warrants carry a limitation on exercise preventing GEO from exercise if such exercise results in GEO beneficially owning in excess of 9.99% of the number of shares of our common stock, which percentage can be increased or decreased at the option of GEO upon 61 days prior notice however not to exceed 19.99%, and the Class C warrants carry a limitation on exercise preventing GEO from exercise if such exercise results in GEO beneficially owning in excess of 4.99% of the number of shares of our common stock, which percentage can be increased or decreased at the option of GEO upon 61 days prior notice however not to exceed 9.99% (the “GEO Beneficial Ownership Blockers”). As previously disclosed, in connection with a private placement closed in July 2022, GEO purchased (i) 6,523,157 shares of our common stock, (ii) pre-funded warrants to purchase 7,182,032 shares of our common stock and (iii) warrants to purchase 13,705,189 shares of our common stock. As a result of the GEO Beneficial Ownership Blockers, the amount reported above as beneficially owned consists of 11,736,793 shares of common stock held by GEO and up to 524,092 shares of common stock issuable upon exercise of pre-funded warrants and/or warrants, including Class C warrants held by GEO. NEA 18 Venture Growth Equity, L.P. (“NEA 18 VGE”) is the sole member of GEO and NEA Partners 18 VGE, L.P. (“NEA Partners 18 VGE”) is the sole general partner of NEA 18 VGE. NEA 18 VGE GP, LLC (“NEA 18 VGE LLC”) and, together with NEA Partners 18 VGE, the “Control Entities”) is the sole general partner of NEA Partners 18 VGE. Ali Behbahani (“Behbahani”), Carmen Chang (“Chang”), Anthony A. Florence, Jr. (“Florence”), Liza Landsman (“Landsman”), Mohamad H. Makhzoumi (“Makhzoumi”), Edward T. Mathers (“Mathers”), Scott D. Sandell (“Sandell”), Peter W. Sonsini (“Sonsini”), Paul Walker (“Walker”) and Rick Yang (“Yang”) are the managers of NEA 18 VGE LLC. The address of the principal business office of GEO, NEA 18 VGE, each Control Entity and Sandell is New Enterprise Associates, 1954 Greenspring Drive, Suite 600, Timonium, MD 21093. The address of the principal business office of Behbahani and Mathers is New Enterprise Associates, 5425 Wisconsin Avenue, Suite 800, Chevy Chase, MD 20815. The address of the principal business office of Chang, Makhzoumi, Sonsini, Walker and Yang is New Enterprise Associates, 2855 Sand Hill Road, Menlo Park, California 94025. The address of the principal business office of Florence and Landsman is New Enterprise Associates, 104 5th Avenue, 19th Floor, New York, NY 10001.
- (3) Based on a Schedule 13G/A filed by OrbiMed Advisors LLC, OrbiMed Private Investments IV, LP, OrbiMed Advisors KKC and OrbiMed Capital GP IV LLC on February 14, 2023. Consists of 5,817,726 shares of common stock held by OrbiMed Private Investments IV, LP (“OPI IV”) and 4,510,923 shares of common stock issuable upon exercise of warrants held by OPI IV. OrbiMed Capital GP IV LLC (“GP IV”) is the general partner of OPI IV. OrbiMed Advisors LLC (“Advisors”) is the managing member of GP IV. By virtue of such relationships, GP IV and Advisors may be deemed to have voting and investment power with respect to the shares held by OPI IV and as a result, may be deemed to have beneficial ownership of such shares. Advisors exercises investment and voting power through a management committee comprised of Carl L. Gordon, Sven H. Borho, and W. Carter Neild. Each of GP IV and Advisors disclaims beneficial ownership of the shares held by OPI IV, except to the extent of its pecuniary interest therein, if any. OPI IV owns 1,373,849 shares of common stock and 462,500 warrants of the Company. The address of the principal business office of each of the aforementioned beneficial owners is 601 Lexington Avenue, 54th Floor, New York, New York 10022.
- (4) Consists of 361,063 shares of common stock, 331,959 shares of common stock underlying options that were exercisable as of April 18, 2023 or will become exercisable within 60 days after such date, and 43,870 shares of common stock underlying restricted stock units that were vested as of April 18, 2023 or will vest within 60 days after such date.
- (5) Consists of 78,810 shares of common stock underlying options that were exercisable as of April 18, 2023 or will become exercisable within 60 days after such date, and 10,834 shares of common stock underlying restricted stock units that were vested as of April 18, 2023 or will vest within 60 days after such date.
- (6) Consists of 62,256 shares of common stock, 63,133 shares of common stock underlying options that were exercisable as of April 18, 2023 or will become exercisable within 60 days after such date, and 5,834 shares of common stock underlying restricted stock units that were vested as of April 18, 2023 or will vest within 60 days of such date.
- (7) Consists of 16,281 shares of common stock underlying options that were exercisable as of April 18, 2023 or will become exercisable within 60 days after such date and 3,333 shares of common stock underlying restricted stock units that were vested as of April 18, 2023 or will become exercisable within 60 days after such date.
- (8) Consists of 62,851 shares of common stock underlying options that were exercisable as of April 18, 2023 or will become exercisable within 60 days after such date and 3,333 shares of common stock underlying restricted stock units that were vested as of April 18, 2023 or will become exercisable within 60 days after such date.
- (9) Consists of 6,125 shares of common stock underlying options that were exercisable as of April 18, 2023 or will become exercisable within 60 days after such date and 3,333 shares of common stock underlying restricted stock units that were vested as of April 18, 2023 or will become exercisable within 60 days after such date.

- (10) Consists of 11,712 shares of common stock underlying options that were exercisable as of April 18, 2023 or will become exercisable within 60 days after such date and 3,333 shares of common stock underlying restricted stock units that were vested as of April 18, 2023 or will become exercisable within 60 days after such date.
- (11) Consists of 18,686 shares of common stock underlying options that were exercisable as of April 18, 2023 or will become exercisable within 60 days after such date and 3,333 shares of common stock underlying restricted stock units that were vested as of April 18, 2023 or will become exercisable within 60 days after such date.
- (12) Consists of 25,170 shares of common stock underlying options that were exercisable as of April 18, 2023 or will become exercisable within 60 days after such date and 3,333 shares of common stock underlying restricted stock units that were vested as of April 18, 2023 or will become exercisable within 60 days after such date.
- (13) Consists of 86,605 shares of common stock underlying options that were exercisable as of April 18, 2023 or will become exercisable within 60 days after such date and 3,333 shares of common stock underlying restricted stock units that were vested as of April 18, 2023 or will become exercisable within 60 days after such date.
- (14) Consists of 458,513 shares of common stock, 779,575 shares of common stock underlying options that were exercisable as of April 18, 2023 or will become exercisable within 60 days after such date, and 83,869 shares of common stock underlying restricted stock units that were vested as of April 18, 2023 or will become exercisable within 60 days after such date.

Delinquent Section 16(a) Reports

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

To our knowledge, based solely on a review of the copies of such reports furnished to us and written representations that no other reports were required, during the fiscal year ended December 31, 2022, all Section 16(a) filing requirements applicable to our officers, directors and greater than ten percent beneficial owners were complied with, except that each of Dr. Bridger, Mr. McGirr, Ms. De Craecker, Ms. Lawton, Mr. Aliski, Dr. Stewart and Mr. Wyzga failed to timely file one Form 4 report, respectively, disclosing the acquisition of 6,667 RSUs that were granted by the Board on June 6, 2022. The Form 4 reports reporting such acquisitions were filed on June 27, 2022.

EXECUTIVE COMPENSATION

Our Compensation Committee is primarily responsible for establishing and reviewing our general compensation strategy. See the section captioned “Compensation Committee Processes and Procedures.”

SUMMARY COMPENSATION TABLE

The following table shows the total compensation paid or accrued during the fiscal years ended December 31, 2022 and December 31, 2021 to (1) the individual who served as our Chief Executive Officer during the fiscal year ended December 31, 2022, and (2) our two next most highly compensated executive officers who earned more than \$100,000 during the fiscal year ended December 31, 2022 and were serving as executive officers as of such date. We refer to these three individuals in this Proxy Statement as our named executive officers.

Our named executive officers for 2022 who appear in the Summary Compensation Table are:

- Paula Ragan, Ph.D., our President and Chief Executive Officer;
- Adam S. Mostafa, our Chief Financial Officer, Treasurer and Corporate Secretary; and
- Mary DiBiase, our Chief Operating Officer.

Name and Principal Position	Year	Salary (\$)	Bonus (\$) ⁽⁵⁾	Stock Awards (\$) ⁽¹⁾	Option Awards (\$) ⁽²⁾	Non-Equity Incentive Plan Compensation (\$) ⁽³⁾	All Other Compensation (\$) ⁽⁴⁾	Total (\$)
Paula Ragan, Ph.D. President and Chief Executive Officer	2022	583,481	58,773	476,904	2,432,049	308,557	12,769	3,872,533
	2021	562,126	—	1,258,272	—	309,330	11,600	2,141,328
Adam S. Mostafa Chief Financial Officer, Treasurer and Secretary	2022	458,973	46,085	226,800	954,900	193,555	569	1,880,882
	2021	430,193	—	723,518	—	185,220	—	1,338,931
Mary DiBiase Chief Operating Officer	2022	426,296	42,793	226,800	954,900	179,730	12,769	1,843,288

- (1) The amounts reported in the “Stock Awards” column reflect the aggregate grant date fair value of restricted stock units awarded during 2022 computed in accordance with the provisions of Financial Accounting Standards Board, Accounting Standards Codification Topic 718 (“ASC 718”). See Note 12 to the X4 Pharmaceuticals Inc. Annual Report on Form 10-K for the year ended December 31, 2022 filed with the SEC on March 21, 2023, regarding assumptions underlying the valuation of equity awards.
- (2) The amounts reported in the “Stock Awards” column reflect the aggregate fair value of stock-based compensation awarded during 2022 computed in accordance with the provisions of ASC 718, which disregards any estimate of forfeitures related to service-based vesting conditions for this purpose. See Note 12 to the X4 Pharmaceuticals Inc. Annual Report on Form 10-K for the year ended December 31, 2022 filed with the SEC on March 21, 2023, regarding assumptions underlying the valuation of equity awards.
- (3) The amounts reported in the “Non-Equity Incentive Plan Compensation” column represent amounts earned pursuant to our annual bonus program, which is based upon our named executive officer’s achievement of predetermined individual and/or company-wide performance goals. Amounts listed for fiscal year 2022, represents amounts earned for the 12-month period from January 1, 2022 to December 31, 2022 and paid in 2023. See “Narrative to Summary Compensation Table—Non-Equity Incentive Plan Compensation” below for more information.
- (4) The amounts reported in the “All Other Compensation” column for fiscal years 2022 reflect 401(k) matching contributions of \$11,600 for Drs. Ragan and DiBiase and the value of group term life insurance provided to each named officer.
- (5) The amounts reported in the “Bonus” column for fiscal year 2022 reflects a special bonus paid in January 2023.

OUTSTANDING EQUITY AWARDS AT FISCAL YEAR END

The following table shows for the fiscal year ended December 31, 2022, certain information regarding outstanding equity awards at fiscal year-end for the named executive officers.

Name	Grant Date	Option and Stock Appreciation Rights (SARS) Awards				Stock Awards	
		Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price (\$)	Option Expiration Date	Equity incentive plan awards: number of unearned shares, units or other rights that have not vested (#)	Equity incentive plan awards: market or payout value of unearned shares, units or other rights that have not vested (\$)
Paula Ragan, Ph.D.	1/19/2016 ⁽¹⁾	100,729	—	6.84	1/18/2026		
	1/24/2017 ⁽¹⁾	65,430	—	6.84	1/23/2027		
	1/31/2018 ⁽¹⁾	80,160	—	7.08	1/30/2028		
	6/17/2019 ⁽³⁾	73,406 ⁽²⁾	10,487 ⁽²⁾	14.75	6/16/2029		
	6/17/2019 ^{(3),(5)}					13,892	13,884
	4/13/2020 ^{(3),(7)}					29,884	29,675
	3/24/2021 ^{(3),(8)}					96,420	95,745
	3/10/2022 ^{(3),(9)}					220,789	219,243
	11/7/2022 ^{(3),(10)}		3,438,335	1.80			
	Adam S. Mostafa	10/4/2018 ⁽¹⁾	62,633	—	10.44	10/3/2028	
6/17/2019 ⁽³⁾	13,866 ⁽²⁾	1,981 ⁽²⁾	14.75	6/16/2029			
6/17/2019 ^{(3),(6)}					2,641	12,096	
4/13/2020 ^{(3),(7)}					10,834	74,425	
3/24/2021 ^{(3),(8)}					55,442	190,443	
3/10/2022 ^{(3),(9)}					105,000	104,265	
11/7/2022 ^{(3),(10)}			1,350,000	1.80			
Mary DiBiase	7/12/2017 ⁽¹⁾	15,205	—	6.84	7/11/2027		
	4/11/2018 ⁽¹⁾	1,900	—	7.08	4/10/2028		
	8/22/2018 ⁽¹⁾	10,112	—	10.44	8/21/2028		
	6/17/2019 ^{(3),(6)}	8,285	1,184 ⁽²⁾	14.75	6/16/2029		
	6/17/2019 ^{(3),(5)}					1,578	1,567
	2/10/2020 ^{(3),(11)}	17,344	5,156	10.00	2/09/2030		
	4/13/2020 ^{(3),(7)}					5,834	5,793
	6/10/2020 ^{(3),(12)}	4,688	2,812	8.69	6/9/2030		
	3/24/2021 ^{(3),(8)}					25,092	24,916
	9/8/2021 ^{(3),(4)}					18,000	17,874
3/10/2022 ^{(3),(9)}					105,000	104,265	
11/7/2022 ^{(3),(10)}			1,350,000	1.80			

(1) This award was granted pursuant to the Company's 2015 Employee, Director and Consultant Equity Incentive Plan. ("2015 Plan").

(2) 25% of the shares subject to the option vested on June 17, 2020, with the remainder vesting in equal installments of 2.0833% of the shares subject to the option on the last day of each month thereafter for a period of 36 months, subject to continued service through each such date.

(3) This award was granted pursuant to the Company's Amended and Restated 2017 Equity Incentive Plan (the "2017 Plan").

(4) Represents restricted stock units, with each restricted stock unit representing the contingent right to receive one share of common stock on the applicable vesting date. No amount was paid upon grant of the restricted stock units. The restricted stock units vest, subject to continued service, in substantially equal annual installments on September 8, 2023 and September 8, 2024.

- (5) Represents restricted stock units, with each restricted stock unit representing the contingent right to receive one share of common stock on the applicable vesting date. No amount was paid upon grant of the restricted stock units. The restricted stock units vest, subject to continued service on May 31, 2023.
- (6) Represents restricted stock units, with each restricted stock unit representing the contingent right to receive one share of common stock on the applicable vesting date. No amount was paid upon grant of the restricted stock units. The restricted stock units vest, subject to continued service, on June 30, 2023.
- (7) Represents PRSUs for which the performance criteria has been achieved, as certified by the Compensation Committee of the Board, and which vest in substantially equal installments, subject to continued service, on June 15, 2023 and June 23, 2023.
- (8) Represents restricted stock units, with each restricted stock unit representing the contingent right to receive one share of common stock on the applicable vesting date. No amount was paid upon grant of the restricted stock units. The restricted stock units vest, subject to continued service, in three substantially equal annual installments on February 11, 2022, February 11, 2023 and February 11, 2024.
- (9) Represents restricted stock units, with each restricted stock unit representing the contingent right to receive one share of common stock on the applicable vesting date. No amount was paid upon grant of the restricted stock units. The restricted stock units vest, subject to continued service, in two substantially equal annual installments on March 10, 2023 and March 10, 2024.
- (10) Represents SARs granted pursuant to the 2017 Plan. The SARs vest and become exercisable in three equal annual installments on the first, second, and third anniversaries of grant date, in each case, subject to continued service.
- (11) 25% of the shares subject to the option vested on November 18, 2020, with the remainder vesting in equal installments of 2.0833% of the shares subject to the option on the last day of each month thereafter for a period of 36 months, subject to continued service through each such date.
- (12) 25% of the shares subject to the option vested on June 10, 2021, with the remainder vesting in equal installments of 2.0833% of the shares subject to the option on the last day of each month thereafter for a period of 36 months, subject to continued service through each such date.

NARRATIVE TO SUMMARY COMPENSATION TABLE

The material terms of the elements of our executive compensation program are described below.

Base Salary

Each named executive officer's base salary is a fixed component of annual compensation for performing specific duties and functions, and has been established by our Board taking into account each individual's role, responsibilities, skills, and experience. Effective January 1, 2022, the Compensation Committee increased Dr. Ragan's base salary for 2022 to \$587,728, increased Mr. Mostafa's base salary for 2022 to \$460,846 and increased Dr. DiBiase's base salary to \$427,928 for 2022. Effective January 1, 2023, the Compensation Committee increased Dr. Ragan's salary to \$620,053, increased Mr. Mostafa's base salary to \$486,192 and increased Dr. DiBiase's salary to \$451,464 for 2023.

Bonus

In January 2023, we paid certain special bonuses to employees, including our named executive officers, in recognition of exceptional performance of services provided during fiscal year 2022. The amount for each employee was generally calculated based on 10% of the employee's annual base salary for 2022.

Non-Equity Incentive Plan Compensation

Our annual bonus program is intended to reward our named executive officers for meeting objective or subjective individual and/or company-wide performance goals for a fiscal year. For 2022 and 2021, our named executive officers received incentive compensation based upon the Board or Compensation Committee's determination of their respective achievement of and performance with respect to corporate objectives, which are described below. Dr. Ragan's, Mr. Mostafa's, and Dr. DiBiase's bonus targets were 50%, 40% and 40%, respectively, of their respective annual base salaries.

In February 2023, the Compensation Committee completed an evaluation of our overall performance for 2022 and the named executive officers' respective contributions in achieving this performance. The Compensation Committee's review was based on company performance against corporate objectives, including advancing research and clinical development of mavoxixafor, expanding the pipeline of other assets, advancing CXCR4 molecules and other assets to further expand our pipeline, maintaining business sustainability, building organizational strength, and preparing the commercialization of medicines for commercial use. Following such review, the Compensation Committee determined that the corporate performance objective were achieved at the 105% level. The Compensation Committee also determined that Dr. Ragan had earned 110% of her target bonus for 2022, equal to a bonus of \$308,557; Mr. Mostafa had earned 105% of his target bonus

for 2022, equal to a bonus of \$193,555; and Dr. DiBiase had earned 105% of her target bonus for 2022, equal to a bonus of \$179,730.

Long-Term Equity Incentives

Our equity grant program is intended to align the interests of our named executive officers with those of our stockholders and to motivate them to make important contributions to our performance.

In March 2022, the Compensation Committee granted restricted stock unit awards to our named executive officers. The restricted stock unit awards vest in two substantially equal annual installments on March 10, 2023 and March 10, 2024, subject to the named executive officer's continued service through each vesting date.

On November 7, 2022, the Compensation Committee approved special retention and recognition grants of stock appreciation rights ("SARs"), pursuant to the 2017 Plan, to our named executive officers. The SARs have a measurement price per SAR equal to \$1.80 and each grant of SARs will have a maximum term of ten years. The SARs will vest and become exercisable in equal annual installments on the first, second, and third anniversaries of the grant date, subject to the recipient remaining an employee of the Company through and including each applicable vesting date.

Employment and Change in Control Arrangements

Paula Ragan, Ph.D.

On March 13, 2019, we entered into an amended and restated executive employment agreement with Dr. Ragan, which was amended and restated again in February 2020, pursuant to which Dr. Ragan agreed to continue serving as our Chief Executive Officer. Pursuant to the employment agreement, Dr. Ragan's compensation consists of base salary at an annual rate approved by our Board or an appropriate committee thereof, an annual performance bonus as determined by our Board (provided that the target for such bonus shall be no less than 25% of Dr. Ragan's annual base salary), fringe benefits, vacation, reimbursement of ordinary and reasonable out-of-pocket expenses and coverage under our Directors' and Officers', or D&O, insurance policies, subject to the terms and conditions of such policies. Dr. Ragan's 2021 base salary was \$562,126, and in March 2022, Dr. Ragan's 2022 annual base salary was increased to \$587,728. Subsequently in March 2023, Dr. Ragan's 2023 annual base salary was increased to \$620,053.

Pursuant to her employment agreement, if Dr. Ragan's employment is terminated for any reason, Dr. Ragan will be entitled to receive her accrued but unpaid salary, accrued but unused vacation days, and the amount of any properly incurred expenses prior to termination not yet reimbursed and other benefits. In addition to the foregoing, if Dr. Ragan's employment is terminated by us without cause or if Dr. Ragan resigns for good reason, each term as defined in her employment agreement, Dr. Ragan will be entitled to the following: (a) a continuation of base salary for 12 months, (b) a pro-rated portion of her target annual bonus for the calendar year in which the termination occurs, (c) so long as Dr. Ragan is eligible for coverage under our health insurance plan, elects coverage, was covered prior to termination, and elects to exercise her rights under COBRA to continue participation in such plan, we will pay the normal share of costs we pay for current employees under such plan until the earlier of 12 months from the date of Dr. Ragan's termination, or the date Dr. Ragan is eligible to receive health benefits through another employer, and (d) Dr. Ragan will become vested in the additional number of outstanding time-based equity awards granted to Dr. Ragan by us that would have otherwise vested had Dr. Ragan remained employed for an additional 12 months after her termination date. In lieu of the foregoing, if Dr. Ragan's employment is terminated without cause or if Dr. Ragan resigns for good reason within the one-year period following a change of control, as that term is defined in the employment agreement, Dr. Ragan will be entitled to the following, in addition to her accrued but unpaid benefits: (a) a continuation of base salary for 18 months, (b) her full annual bonus for the calendar year in which the termination occurs, (c) so long as Dr. Ragan is eligible for coverage under our health insurance plan, elects coverage, was covered prior to termination, and elects to exercise her rights under COBRA to continue participation in such plan, we will pay the normal share of costs we pay for current employees under such plan until the earlier of 12 months from the date of Dr. Ragan's termination, or the date Dr. Ragan is eligible to receive health benefits through another employer, and (d) automatic vesting in all outstanding time-based equity awards granted to Dr. Ragan by us, subject to the terms and conditions of the applicable award agreements. As a condition to receiving the foregoing severance benefits, Dr. Ragan must execute and not revoke a separation agreement in a form acceptable to us and which will include a complete release of claims and terms related to non-disparagement, non-competition, confidentiality and cooperation.

Dr. Ragan's employment agreement also contains her agreement to continue to abide by the terms of her non-competition, non-solicitation, non-disclosure and intellectual property agreement.

In addition, Dr. Ragan's employment agreement provides that in the event the severance and other benefits provided for or otherwise payable to Dr. Ragan constitute "parachute payments" within the meaning of Section 280G of the Internal Revenue

Code of 1986, as amended (the “Code”) and are subject to the excise tax imposed by Section 4999 of the Code, we will pay either (i) Dr. Ragan’s severance benefits under the employment agreement in full or (ii) only a part of Dr. Ragan’s severance benefits under the employment agreement such that Dr. Ragan receives the largest payment possible without the imposition of the excise tax, in each case, depending upon which alternative would result in Dr. Ragan receiving the greater net after-tax payment.

Adam S. Mostafa

On March 13, 2019, we entered into an amended and restated executive employment agreement with Mr. Mostafa, which was amended and restated again in March 2022, pursuant to which Mr. Mostafa agreed to continue serving as our Chief Financial Officer. Pursuant to the employment agreement, Mr. Mostafa’s compensation consists of base salary at an annual rate approved by our Board or an appropriate committee thereof, an annual performance bonus as determined by our Board (provided that the target for such bonus shall not be less than 25% of Mr. Mostafa’s annual base salary), fringe benefits, vacation, reimbursement of ordinary and reasonable out-of-pocket expenses and coverage under our D&O insurance policies, subject to the terms and conditions of such policies. Mr. Mostafa’s base salary in 2021 was \$430,193 and in March 2022, Mr. Mostafa’s 2022 annual base salary was increased to \$460,846. Subsequently in March 2023, ’s 2023, Mr. Mostafa’s 2023 annual base salary was increased to \$486,192.

Pursuant to his employment agreement, if Mr. Mostafa’s employment is terminated for any reason, Mr. Mostafa is entitled to receive his accrued but unpaid salary, accrued but unused vacation days, the amount of any properly incurred expenses prior to termination not yet reimbursed and other benefits. In addition to the foregoing, if Mr. Mostafa’s employment is terminated by us without cause or if Mr. Mostafa resigns for good reason, each term as defined in the agreement, Mr. Mostafa will be entitled to the following: (a) a continuation of base salary for 12 months, (b) a pro-rated portion of Mr. Mostafa’s target annual bonus for the calendar year in which the termination occurs based on the period worked by Mr. Mostafa during such calendar year prior to termination, (c) so long as Mr. Mostafa is eligible for coverage under our health insurance plan, elects coverage, was covered prior to termination, and elects to exercise his rights under COBRA to continue participation in such plan, we will pay the normal share of costs we pay for current employees under such plan until the earlier of six months from the date of Mr. Mostafa’s termination or the date Mr. Mostafa is eligible to receive health benefits through another employer, and (d) Mr. Mostafa will become vested in the additional number of outstanding time-based equity awards granted to Mr. Mostafa by us that would have otherwise vested had Mr. Mostafa remained employed for an additional six months after his termination date. In lieu of the foregoing, if Mr. Mostafa’s employment is terminated without cause or if Mr. Mostafa resigns for good reason within the one-year period following a change of control, as that term is defined in the agreement, Mr. Mostafa will be entitled to the following, in addition to his accrued but unpaid benefits: (a) a continuation of base salary for 12 months, (b) Mr. Mostafa’s full annual bonus for the calendar year in which the termination occurs, (c) so long as Mr. Mostafa is eligible for coverage under our health insurance plan, elects coverage, was covered prior to termination, and elects to exercise his rights under COBRA to continue participation in such plan, we will pay the normal share of costs we pay for current employees under such plan until the earlier of six months from the date of Mr. Mostafa’s termination or the date Mr. Mostafa is eligible to receive health benefits through another employer, and (d) automatic vesting in all outstanding time-based equity awards granted to Mr. Mostafa by us, subject to the terms and conditions of the agreement. As a condition to receiving the foregoing severance benefits, Mr. Mostafa must execute and not revoke a separation agreement in a form acceptable to us and which will include a complete release of claims and terms related to non-disparagement, non-competition, confidentiality and cooperation.

Mr. Mostafa agreed to continue to abide by the terms of his non-competition, non-solicitation, non-disclosure and intellectual property agreement.

In addition, Mr. Mostafa’s employment agreement provides that in the event the severance and other benefits provided for or otherwise payable to Mr. Mostafa constitute “parachute payments” within the meaning of Section 280G of the Code and are subject to the excise tax imposed by Section 4999 of the Code, we will pay either (i) Mr. Mostafa’s severance benefits under the employment agreement in full or (ii) only a part of Mr. Mostafa’s severance benefits under the employment agreement such that Mr. Mostafa receives the largest payment possible without the imposition of the excise tax, in each case, depending upon which alternative would result in Mr. Mostafa receiving the greater net after-tax payment.

Mary DiBiase

On September 8, 2021, we entered into an amended and restated executive employment agreement with Dr. DiBiase, which was amended and restated again in March 2022, pursuant to which Dr. DiBiase agreed to continue serving as our Chief Operating Officer. Pursuant to the employment agreement, Dr. DiBiase’s compensation consists of base salary at an annual rate approved by the Company, an annual performance bonus as determined by the Company with a target of up to 40% of Dr. DiBiase’s annual base salary, fringe benefits, vacation, reimbursement of ordinary and reasonable out-of-pocket

expenses, subject to the terms and conditions of such policies. Dr. DiBiase's 2021 base salary was \$409,500 and in March 2022, Dr. DiBiase's 2022 annual base salary was increased to \$427,928. Subsequently in March 2023, Dr. DiBiase's 2023 annual base salary was increased to \$451,464.

Pursuant to her employment agreement, if Dr. DiBiase's employment is terminated for any reason, Dr. DiBiase will be entitled to receive her accrued but unpaid salary and the amount of any properly incurred expenses prior to termination not yet reimbursed and other benefits. In addition to the foregoing, if Dr. DiBiase's employment is terminated by us without cause or if Dr. DiBiase resigns for good reason, each term as defined in her employment agreement, Dr. DiBiase will be entitled to the following: (a) a continuation of base salary for 12 months, (b) a pro-rated portion of her target annual bonus for the calendar year in which the termination occurs, (c) so long as Dr. DiBiase is eligible for coverage under our health insurance plan, elects coverage, was covered prior to termination, and elects to exercise her rights under COBRA to continue participation in such plan, we will pay the normal share of costs we pay for current employees under such plan until the earlier of 6 months from the date of Dr. DiBiase's termination, or the date Dr. DiBiase is eligible to receive health benefits through another employer, and (d) Dr. DiBiase will become vested in the additional number of outstanding time-based equity awards granted to Dr. DiBiase by us that would have otherwise vested had Dr. DiBiase remained employed for an additional 6 months after her termination date. In lieu of the foregoing, if Dr. DiBiase's employment is terminated without cause or if Dr. DiBiase resigns for good reason within the one-year period following a change of control, as that term is defined in the employment agreement, Dr. DiBiase will be entitled to the following, in addition to her accrued but unpaid benefits: (a) a continuation of base salary for 12 months, (b) her full annual bonus for the calendar year in which the termination occurs, (c) so long as Dr. DiBiase is eligible for coverage under our health insurance plan, elects coverage, was covered prior to termination, and elects to exercise her rights under COBRA to continue participation in such plan, we will pay the normal share of costs we pay for current employees under such plan until the earlier of 6 months from the date of Dr. DiBiase's termination, or the date Dr. DiBiase is eligible to receive health benefits through another employer, and (d) automatic vesting in all outstanding time-based equity awards granted to Dr. DiBiase by us, subject to the terms and conditions of the applicable award agreements. As a condition to receiving the foregoing severance benefits, Dr. DiBiase must execute and not revoke a separation agreement in a form acceptable to us and which will include a complete release of claims and terms related to non-disparagement and no cooperation.

Dr. DiBiase's employment agreement also contains her agreement to continue to abide by the terms of her confidentiality, non-competition, non-solicitation and intellectual property agreement.

Equity Awards

100% of the unvested portion of any PRSUs will vest upon the termination of the named executive officer's employment by the Company without "cause" (as defined in the 2017 Plan) upon or at any time within 12 months following a "change of control" (as defined in the 2017 Plan), subject to the terms of each individual's respective employment agreement. In addition, the vesting of the SARs will also accelerate in full upon the occurrence of a "change of control" (as defined in the award agreement with respect to the SARs), provided that the recipient remains employed by the Company through the date of such change of control. RSUs will vest in accordance with each named executive officer's employment agreement, as described above.

401(k) Plan

We maintain a defined contribution retirement plan that provides eligible U.S. employees with an opportunity to save for retirement on a tax-advantaged basis. Eligible employees may defer eligible compensation on a pre-tax basis, up to the statutorily prescribed annual limits on contributions under the Code. Contributions are allocated to each participant's individual account and are then invested in selected investment alternatives according to the participants' directions. Employees are immediately and fully vested in their contributions. We provide a discretionary matching contribution equal to 100% of employee contributions up to a maximum of 4% of eligible compensation, as defined under the 401(k) plan. The 401(k) plan is intended to be qualified under Section 401(a) of the Code with the 401(k) plan's 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 and earnings on those contributions are not taxable to the employees until distributed from the 401(k) plan.

Health and Welfare Benefits

All of our full-time employees, including our named executive officers, and certain of our part-time employees are eligible to participate in our health and welfare benefit plans, including our medical, dental, life and long-term disability insurance plans. Our health and welfare benefit plans do not discriminate in scope, terms or operation in favor of our executive officers.

PAY vs. PERFORMANCE

As required by Section 953(a) of the Dodd-Frank Wall Street Reform and Consumer Protection Act, and Item 402(v) of Regulation S-K, we are providing the following information about the relationship between executive “compensation actually paid” (CAP) to our principal executive officer (PEO) and our non-PEO named executive officers (NEOs) in the applicable years, and certain financial performance of the Company.

Year ⁽¹⁾	Summary Compensation Total for PEO (2)	Compensation Actually Paid for PEO (3)	Average Summary Compensation Table Total for non-PEO NEOs (4)	Average Compensation Actually Paid for non- PEO NEOs (3)	Value of \$100 Initial Investment based on Total Shareholder Return (5)	Net Loss (\$000) (6)
(a)	(b)	(c)	(d)	(e)	(f)	(g)
2022	\$ 3,872,533	\$ 3,300,353	\$ 1,862,085	\$ 1,611,499	15.44	\$ (93,867)
2021	\$ 2,141,328	\$ 667,290	\$ 1,189,100	\$ 572,159	35.61	\$ (88,696)

- (1) We are a smaller reporting company pursuant to Rule 405 of the Securities Act of 1933, and as such, are only required to include information for the past two fiscal years in this table. Our PEO in both reporting years is Dr. Ragan. Our non-PEO NEOs in the 2022 reporting year were Mr. Mostafa and Dr. DiBiase. Our non-PEO NEOs in the 2021 reporting year were Mr. Mostafa and Mr. Meisner.
- (2) The dollar amounts reported in column (b) are the amounts of total compensation reported for Dr. Ragan for each corresponding year in the “Total” column of the Summary Compensation Table. Refer to “Executive Compensation—Summary Compensation Table.”
- (3) The dollar amounts reported in columns (c) and (e) represent the CAP to our PEO and average CAP paid to our non-PEO NEOs, respectively, as computed in accordance with Item 402(v) of Regulation S-K. The dollar amounts do not reflect the actual amount of compensation earned by or paid to our PEO or the average amounts paid to our non-PEO NEOs during the applicable year. In accordance with the requirements of Item 402(v) of Regulation S-K, the following adjustments were made to our PEO’s and our non-PEO NEOs’ compensation for each year to determine the CAP and average CAP, respectively:

Current Fiscal Year	PEO		NEOs	
	2022	2021	2022	2021
SCT Total	\$ 3,872,533	\$ 2,141,328	\$ 1,862,085	\$ 1,189,100
Grant Date Fair Value of Awards Granted in Fiscal Year (a)	(2,908,953)	(1,258,272)	(1,181,700)	(569,376)
Fair Value at Fiscal Year-End of Outstanding and Unvested Option Awards and Stock Awards Granted in Fiscal Year (b)	2,651,292	331,200	1,059,165	149,870
Change in Fair Value of Outstanding and Unvested Option Awards and Stock Awards Granted in Prior Fiscal Years (b)	(187,499)	(578,588)	(80,725)	(201,431)
Change in Fair Value as of Vesting Date of Option Awards and Stock Awards Granted in Prior Fiscal Years For Which Applicable Vesting Conditions Were Satisfied During Fiscal Year (b)	(127,020)	31,622	(47,326)	3,996
Compensation Actually Paid (CAP)	<u>\$ 3,300,353</u>	<u>\$ 667,290</u>	<u>\$ 1,611,499</u>	<u>\$ 572,159</u>

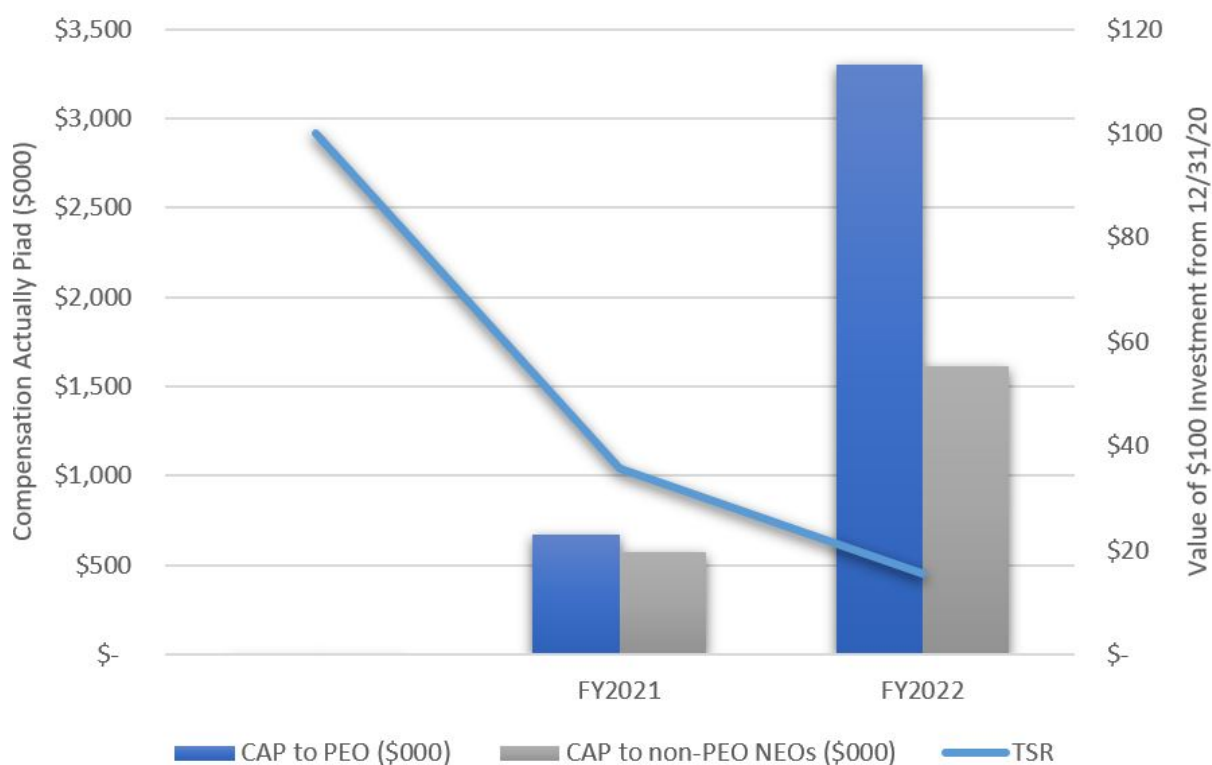
- (a) The fair value grant date fair value of equity awards represents the total of the amounts reported in the “Stock Awards” and/or “Option Awards” columns in the Summary Compensation Table for the applicable year.
- (b) The fair value of stock options reported for CAP purposes is estimated using a Black-Scholes option pricing model for purposes of this PVP calculation in accordance with the SEC rules. This model uses both historical data and current market data to estimate the fair value of options and requires several assumptions. The assumptions used in estimating fair value for awards granted and vesting during fiscal years 2022 and 2021 are as follows:

	2022	2021
Risk-free interest rate	1.7% - 4.3%	0.5% - 1.5%
Expected term (in years)	3.0 - 4.8	3.2 - 3.7
Expected volatility	94.5% - 101.4%	94.5% - 97.0%
Expected dividend yield	—%	—%

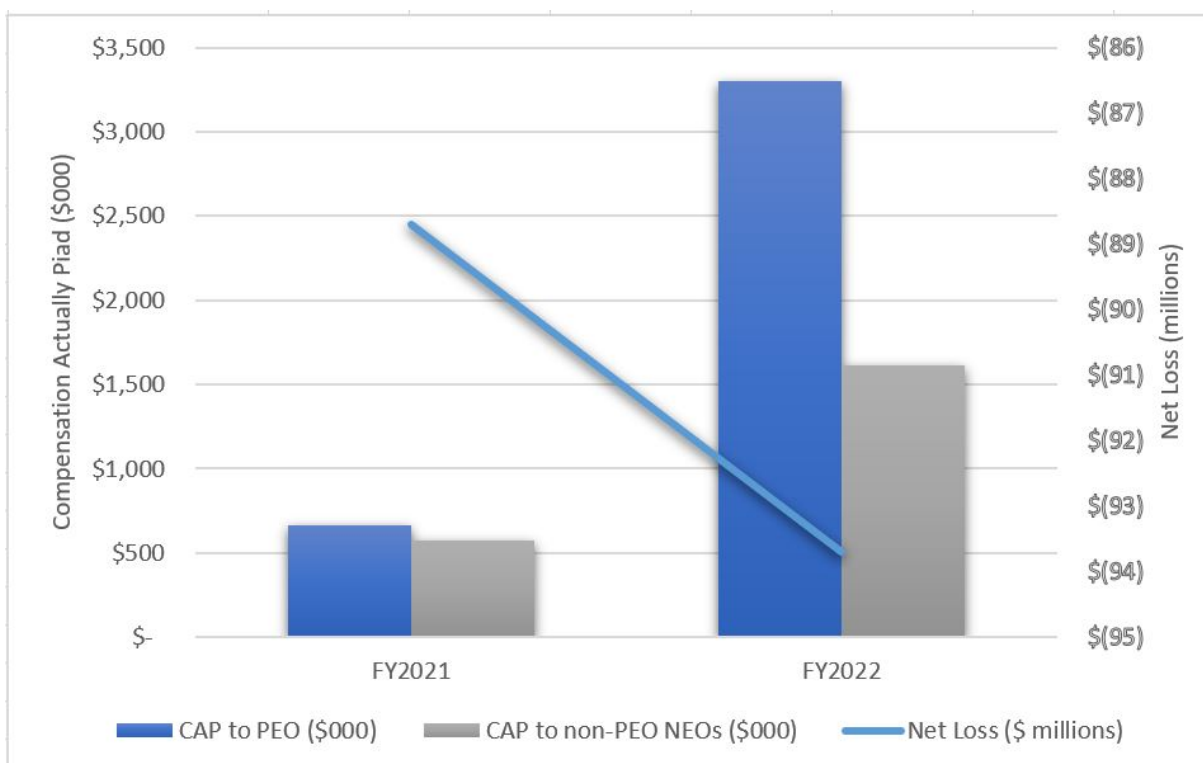
- (4) The dollar amounts reported represent the average of the amounts reported for our non-PEO NEOs in the “Total” column of the Summary Compensation Table in each applicable year. Refer to “Executive Compensation—Summary Compensation Table.”
- (5) The Company’s total shareholder return (TSR) reflected in this column for each applicable fiscal year is calculated based on a fixed investment of \$100 at the applicable measurement point on the same cumulative basis as is used in Item 201(e) of Regulation S-K.
- (6) The dollar amounts reported represent the amount of net income (or loss) reflected in the Company’s audited financial statements for the applicable year.

Pay Versus Performance Comparative Disclosure

The graphs below reflect the relationship between PEO CAP, average Non-PEO NEO CAP and the Company’s cumulative indexed TSR, (assuming an initial fixed investment of \$100) for the fiscal years ended December 31, 2022 and 2021:



The graph below reflects the relationship between the PEO CAP, and average Non-PEO NEO CAP and the Company’s Net Income (Loss) for the applicable reporting year.



All information provided above under the “Pay Versus Performance” heading will not be deemed to be incorporated by reference into any filing of the Company under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing, except to the extent the Company specifically incorporates such information by reference.

DIRECTOR COMPENSATION FOR FISCAL YEAR 2022

Name ⁽¹⁾	Fees Earned or Paid in Cash (\$)	Stock Awards (\$) ⁽²⁾⁽³⁾	Total (\$)
William E. Aliski, MPA	\$ 42,788	\$ 7,734	\$ 50,522
Gary J. Bridger, Ph.D.	\$ 35,000	\$ 7,734	\$ 42,734
Francoise de Craecker	\$ 40,000	\$ 7,734	\$ 47,734
Alison Lawton	\$ 42,500	\$ 7,734	\$ 50,234
David McGirr, M.B.A.	\$ 54,000	\$ 7,734	\$ 61,734
Murray W. Stewart, M.D. ⁽⁴⁾	\$ 37,908	\$ 7,734	\$ 45,642
Michael S. Wyzga	\$ 87,288	\$ 7,734	\$ 95,022

(1) Dr. Ragan, one of our directors who also serves as our Chief Executive Officer and President, did not receive any additional compensation for her service director. Dr. Ragan is a named executive officer and, accordingly, the compensation that we pay to Dr. Ragan is described under “—Summary Compensation Table” and “—Narrative Disclosure to Summary Compensation Table.”

(2) The amounts reported in the “Stock Awards” column reflect the aggregate grant date fair value of restricted stock awarded during 2022 computed in accordance with the provisions of ASC 718. See Note 12 to our consolidated financial statements appearing in our Annual Report on Form 10-K for the fiscal year ended December 31, 2022 filed with the SEC on March 21, 2023, regarding assumptions underlying the valuation of equity awards.

- (3) The aggregate number of shares subject to outstanding stock options held by each director listed in the table above as of December 31, 2022 was as follows: 16,281 shares for Mr. Aliski; 67,851 shares for Dr. Bridger; 12,250 for Ms. de Craecker; 12,854 for Ms. Lawton; 18,686 shares for Mr. McGirr; 26,281 shares for Dr. Stewart; and 86,605 shares for Mr. Wyzga.
- (4) Dr. Stewart served as an outside director during 2022 until his transition to our interim Chief Medical Officer in November 2022 and continued to serve our Board thereafter.

NARRATIVE TO DIRECTOR COMPENSATION TABLE

Non-Employee Director Compensation Policy in Effect for Fiscal Year 2022

In March 2022, our Board, upon the recommendation of the Compensation Committee, approved an amendment to our non-employee director compensation policy. Pursuant to the policy, for 2022, the initial equity grant to non-employee directors joining the Board consisted of 13,333 restricted stock units (“RSUs”) vesting in equal annual installments on the first two anniversaries of the date of grant, subject to the non-employee director’s continued service as a director. This vesting accelerates as to 100% of the RSUs upon a change in control of the Company.

Further, on the date of our annual meeting of stockholders, each non-employee director that had served on our Board for at least six months was eligible to receive 6,667 RSUs vesting in equal annual installments on the first two anniversaries of the date of grant, subject to the non-employee director’s continued service as a director, with 100% acceleration of vesting upon a change in control of the Company.

For fiscal year 2022, we paid our non-employee directors a cash retainer for service on the Board and for service on each committee on which the director was a member. The Chairman of the Board and the Chair of each committee received higher retainers for such service. These fees are payable in arrears in four equal quarterly installments on the last day of each quarter, provided that the amount of such payment would be prorated for any portion of such quarter that the director was not serving on the Board, on such committee or in such position. The fees paid to non-employee directors for service on the Board, for service as a Lead Independent Director and for service on each committee of the Board on which the director was a member were as follows:

	Annual Retainer Amount for Member (excluding Chair)	Annual Retainer Amount for Chair
Board of Directors	\$ 35,000	\$ 75,000
Audit Committee	\$ 7,500	\$ 15,000
Compensation Committee	\$ 5,000	\$ 10,000
Nominating and Corporate Governance Committee	\$ 4,000	\$ 8,000

We also reimburse our non-employee directors for reasonable travel and other expenses incurred in connection with attending meetings of the Board and any committee of the Board of Directors on which they served.

Non-Employee Director Compensation Policy Effective March 2023

In March 2023, our Board, upon the recommendation of the Compensation Committee, further updated our non-employee director compensation policy as follows:

- The initial equity grant was increased to 90,000 RSUs, vesting in three equal installments on each of the first three anniversaries of the date of grant, subject to the non-employee director’s continued service as a director through each such date. 100% of the initial award will accelerate and become vested upon a change in control of the Company.
- The annual equity grant was increased to 45,000 RSUs, vesting in full on the one-year anniversary of the date of grant (or, if earlier, the date of our next annual meeting of stockholders following the date of grant), subject to the non-employee director’s continued service as a director through such date. 100% of the annual award will accelerate and become vested upon a change in control of the Company.

The non-employee director compensation policy otherwise remained unchanged from 2022.

SECURITIES AUTHORIZED FOR ISSUANCE UNDER EQUITY COMPENSATION PLANS

EQUITY COMPENSATION PLAN INFORMATION

The following table provides certain information with respect to all of our equity compensation plans in effect as of December 31, 2022:

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (a)	Weighted-average exercise price of outstanding options, warrants and rights (b)	Number of securities remaining available for issuance under equity compensation plans (excluding securities reflected in column (a)) (c)
Equity compensation plans approved by security holders	357,689 ⁽¹⁾	\$ 11.89 ⁽²⁾	356,853 ⁽³⁾
Equity compensation plans not approved by security holders	1,663,791 ⁽⁴⁾	\$ 5.94 ⁽⁵⁾	346,542 ⁽⁶⁾
Total	2,021,480	\$ 6.99	703,395 ⁽⁷⁾

(1) Consists of (i) 3,300 shares to be issued upon exercise of outstanding options under the 2011 Plan, as of December 31, 2022, and (ii) 354,389 shares to be issued upon exercise of outstanding options under the 2017 Plan, as of December 31, 2022.

(2) Consists of the weighted-average exercise price of the 357,689 stock options outstanding on December 31, 2022.

(3) Consists of (i) 298,101 shares that remained available for future issuance under the 2017 Plan as of December 31, 2022 and (ii) 58,752 shares that remained available for future issuance under our 2017 Employee Stock Purchase Plan (the "2017 ESPP"), as of December 31, 2022. No shares remained available for future issuance under the 2010 Plan or the 2011 Plan, as of December 31, 2022.

(4) Consists of (i) 708,647 shares to be issued upon exercise of outstanding options under the 2015 Plan, as of December 31, 2022 and (ii) 955,144 shares to be issued upon exercise of outstanding options under our 2019 Inducement Equity Incentive Plan, as of December 31, 2022 (the "Inducement Plan"). Descriptions of the 2015 Plan and the Inducement Plan are contained in Note 12 of the notes to our consolidated financial statements contained in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on March 21, 2023.

(5) Consists of the weighted-average exercise price of the 1,663,791 stock options outstanding on December 31, 2022.

(6) Consists of (i) 19,186 shares that remained available for future issuance under the 2015 Plan, as of December 31, 2022, and (ii) 327,356 shares that remained available for future issuance under the Inducement Plan, as of December 31, 2022.

(7) The 2017 Plan has an evergreen provision, as amended, that allows for an annual increase in the number of shares available for issuance under the 2017 Plan to be added on the first day of each fiscal year, beginning with the fiscal year ended December 31, 2018 and continuing for each fiscal year until, and including, the fiscal year ending December 31, 2027. The evergreen provides for an automatic increase in the number of shares available for issuance equal to the least of (i) 4% of the number of outstanding such date and (ii) an amount determined by our Board. The 2017 ESPP has an evergreen provision that allows for an annual increase in the number of shares available for issuance under the 2017 ESPP to be added on the first day of each fiscal year, beginning on January 1, 2019 and ending on December 31, 2029, in an amount equal to the least of (i) 85,457 shares of our common stock, (ii) 2% of the total number of outstanding shares as of such date and (iii) an amount determined by our Board.

TRANSACTIONS WITH RELATED PERSONS AND INDEMNIFICATION

RELATED-PERSON TRANSACTIONS POLICY AND PROCEDURES

Our Board of Directors has adopted a written related person transaction policy to set forth policies and procedures for the review of any transaction, arrangement or relationship in which our company is a participant, the amount involved exceeds \$120,000, and one of our executive officers, directors, director nominees or 5% stockholders, or their immediate family members, each of whom we refer to as a “related person,” has a direct or indirect material interest.

If a related person proposes to enter into such a transaction, arrangement or relationship, which we refer to as a “related party transaction,” the related person must report the proposed related person transaction to our Chief Financial officer. The policy calls for the proposed related person transaction to be reviewed and approved by our Audit Committee. Whenever practicable, the reporting, review and approval will occur prior to entry into the transaction. If advance review and approval is not practicable, Audit Committee will review and, in its discretion, may ratify the related person transaction. The policy also permits the Chair of the Audit Committee to review and, if deemed appropriate, approve proposed related person transactions that arise between Audit Committee meetings, subject to ratification by the Audit Committee at its next meeting. Any related person transactions that are ongoing in nature will be reviewed annually.

A related person transaction reviewed under this policy will be considered approved or ratified if it is authorized by the Audit Committee in accordance with the standards set forth in the policy after full disclosure of the related person’s interests in the transaction. As appropriate for the circumstances, the policy provides that the Audit Committee will review and consider:

- the related person’s interest in the related person transaction;
- the approximate dollar value of the amount involved in the related person transaction;
- the approximate dollar value of the amount of the related person’s interest in the transaction without regard to the amount of any profit or loss;
- whether the transaction was undertaken in the ordinary course of our business;
- whether the terms of the transaction are no less favorable to us than the terms that could have been reached with an unrelated third party;
- the purpose of, and the potential benefits to us of, the transaction; and
- any other information regarding the related person transaction or the related person in the context of the proposed transaction that would be material to investors in light of the circumstances of the particular transaction.

The Audit Committee may approve or ratify the related person transaction only if the Audit Committee determines that, under all of the circumstances, the transaction is in our best interests. The Audit Committee may impose any conditions on the related person transaction as it deems appropriate. The policy also provides that transactions involving compensation of executive officers will be reviewed and approved by our Compensation Committee in the manner specified in its charter.

For purposes of the policy, we refer to certain related-party transactions below in which (a) we were a participant, (b) the amount involved exceeded or will exceed \$120,000 or, during such time as we qualify as a “smaller reporting company,” the lesser of (1) \$120,000 or (2) 1% of the average of our total assets for the last two completed fiscal years, and (c) one or more related persons had a direct or indirect material interest. Transactions involving compensation for services provided to us by an employee, director, consultant or individual performing in a similar capacity by a related person are not covered by this policy.

CERTAIN RELATED-PERSON TRANSACTIONS

Since January 1, 2021, we have engaged in, or currently propose to engage in, the following related-party transactions. We believe that all of these transactions were on terms comparable to terms that could have been obtained from unrelated third parties.

Agreements with Directors

Gary J. Bridger, Ph.D.

On September 17, 2020, we entered into an independent contractor agreement, as amended, with Gary J. Bridger, Ph.D., pursuant to which Dr. Bridger was entitled to receive \$30,000 per month and a non-qualified stock option to purchase 30,000 shares of our common stock in consideration for his performance of certain consulting services to the Company during the period from September 17, 2020 to January 1, 2023. We granted Dr. Bridger an option to purchase 30,000 shares of our common stock at a strike price of \$7.33 on October 5, 2020. The consulting agreement terminated in January 2023.

Murry W. Stewart, M.D.

On September 17, 2020, we entered into an independent contractor agreement with Murray W. Stewart, M.D., pursuant to which Dr. Stewart was entitled to receive \$450 per hour and a non-qualified stock option to purchase 10,000 shares of our common stock in consideration for his performance of certain consulting services to the Company during the period from September 17, 2020 to September 17, 2021. We granted Dr. Stewart an option to purchase 10,000 shares of our common stock at a strike price of \$7.27 on October 20, 2020.

Employment Arrangements

We have entered into employment agreements with our executive officers. Each of our executive officers has entered into a written employment agreement with us that provides for payment of base salary, target annual cash incentive compensation, eligibility for employee benefit programs and potential severance benefits. For more information regarding these agreements with our named executive officers, see “Executive Compensation.”

Equity Awards Granted to Executive Officers and Directors

We have granted options to our executive officers and directors. For more information regarding the equity awards granted to our named executive officers and directors, see “Executive Compensation” and “Director Compensation for Fiscal Year 2022.”

INDEMNIFICATION

We provide indemnification for our directors and executive officers so that they will be free from undue concern about personal liability in connection with their service to us. Under our Bylaws, we are required to indemnify our directors and executive officers to the extent not prohibited under Delaware or other applicable law. We have also entered into indemnity agreements with certain officers and directors. These agreements provide, among other things, that we will indemnify the officer or director, under the circumstances and to the extent provided for in the agreement, for expenses, damages, judgments, fines and settlements he or she may be required to pay in actions or proceedings which he or she is or may be made a party by reason of his or her position as a director, officer or other agent of the Company, and otherwise to the fullest extent permitted under Delaware law and our Bylaws.

HOUSEHOLDING OF PROXY MATERIALS

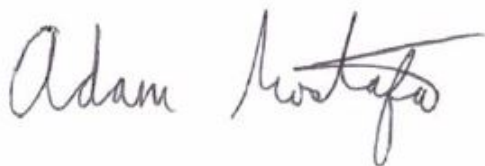
The SEC has adopted rules that permit companies and intermediaries (e.g., brokers) to satisfy the delivery requirements for Notices of Internet Availability of Proxy Materials or other Annual Meeting materials with respect to two or more stockholders sharing the same address by delivering a single Notice 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 X4 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 X4. Direct your written request to X4 Pharmaceuticals, Inc., Attn: Corporate Secretary, 61 North Beacon Street, 4th Floor, Boston, MA 02134 or contact the Corporate Secretary at (857) 529-8300. 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 of Directors 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 such matters in accordance with their best judgment.

By Order of the Board of Directors,

A handwritten signature in cursive script that reads "Adam Mostafa". The signature is written in dark ink and is positioned above the printed name and title.

Adam Mostafa
Chief Financial Officer, Treasurer and Corporate
Secretary

April 25, 2023

A copy of the Company's Annual Report to the Securities and Exchange Commission on Form 10-K for the fiscal year ended December 31, 2022 is available without charge upon written request to: Corporate Secretary, X4 Pharmaceuticals, Inc., 61 North Beacon Street, 4th Floor, Boston, MA 02134.

APPENDIX A

X4 PHARMACEUTICALS, INC.

AMENDED AND RESTATED
2017 EMPLOYEE STOCK PURCHASE PLAN

The purpose of this Amended and Restated 2017 Employee Stock Purchase Plan (this “Plan”) is to provide eligible employees of X4 Pharmaceuticals, Inc. (the “Company”) and certain of its subsidiaries with opportunities to purchase shares of the Company’s common stock, \$0.001 par value per share (the “Common Stock”), commencing at such time and on such dates as the Board of Directors of the Company (the “Board”) shall determine. Subject to adjustment under Section 15 hereof, the number of shares of Common Stock that have been approved for this purpose will not exceed 5,149,616 shares of Common Stock.

This Plan is intended to qualify as an “employee stock purchase plan” as defined in Section 423 of the Internal Revenue Code of 1986, as amended (the “Code”), and the regulations issued thereunder, and shall be interpreted consistent therewith.

1. Administration. The Plan will be administered by the Board or by a Committee appointed by the Board (the “Committee”). The Board or the Committee has authority to make rules and regulations for the administration of the Plan and its interpretation and decisions with regard thereto shall be final and conclusive.

2. Eligibility. All employees of the Company and all employees of any subsidiary of the Company (as defined in Section 424(f) of the Code) designated by the Board or the Committee from time to time (a “Designated Subsidiary”), are eligible to participate in any one or more of the offerings of Options (as defined in Section 9) to purchase Common Stock under the Plan provided that:

(a) they are customarily employed by the Company or a Designated Subsidiary for more than 20 hours a week and for more than five months in a calendar year;

(b) they have been employed by the Company or a Designated Subsidiary for at least three (3) months prior to enrolling in the Plan; and

(c) they are employees of the Company or a Designated Subsidiary on the first day of the applicable Plan Period (as defined below).

No employee may be granted an Option hereunder if such employee, immediately after the Option is granted, owns 5% or more of the total combined voting power or value of the stock of the Company or any subsidiary. For purposes of the preceding sentence, the attribution rules of Section 424(d) of the Code shall apply in determining the stock ownership of an employee, and all stock that the employee has a contractual right to purchase shall be treated as stock owned by the employee.

The Company retains the discretion to determine which eligible employees may participate in an offering pursuant to and consistent with Treasury Regulation Sections 1.423- 2(e) and (f).

3. Offerings. The Company will make one or more offerings (“Offerings”) to employees to purchase stock under this Plan. Offerings will begin at such time and on such dates

as the Board shall determine, or the first business day thereafter (such dates, the “Offering Commencement Dates”). Each Offering Commencement Date will begin a six (6) month period (a “Plan Period”) during which payroll deductions will be made and held for the purchase of Common Stock at the end of the Plan Period. However, the Board or the Committee may, at its discretion, choose a different Plan Period of not more than twelve (12) months for Offerings.

4. Participation. An employee eligible on the Offering Commencement Date of any Offering may participate in such Offering by completing and forwarding either a written or electronic payroll deduction authorization form to the employee’s appropriate payroll office at least 15 days prior to the applicable Offering Commencement Date. The form will authorize a regular payroll deduction from the Compensation received by the employee during the Plan Period. Unless an employee files a new form or withdraws from the Plan, his or her deductions and purchases will continue at the same rate for future Offerings under the Plan as long as the Plan remains in effect. The term “Compensation” means the amount of money reportable on the employee’s Federal Income Tax Withholding Statement, excluding overtime, shift premium, incentive or bonus awards, allowances and reimbursements for expenses such as relocation allowances for travel expenses, income or gains associated with the grant or vesting of restricted stock, income or gains on the exercise of Company stock options or stock appreciation rights, and similar items, whether or not shown or separately identified on the employee’s Federal Income Tax Withholding Statement, but including, in the case of salespersons, sales commissions to the extent determined by the Board or the Committee.

5. Deductions. The Company will maintain payroll deduction accounts for all participating employees. With respect to any Offering made under this Plan, an employee may authorize a payroll deduction in any percentage amount (in whole percentages) up to a maximum of 15% of the Compensation he or she receives during the Plan Period or such shorter period during which deductions from payroll are made. The Board or the Committee may, at its discretion, designate a lower maximum contribution rate. The minimum payroll deduction is such percentage of Compensation as may be established from time to time by the Board or the Committee.

6. Deduction Changes. An employee may decrease or discontinue his or her payroll deduction once during any Plan Period, by filing either a written or electronic new payroll deduction authorization form. However, an employee may not increase his or her payroll deduction during a Plan Period. If an employee elects to discontinue his or her payroll deductions during a Plan Period, but does not elect to withdraw his or her funds pursuant to Section 8 hereof, funds deducted prior to his or her election to discontinue will be applied to the purchase of Common Stock on the Exercise Date (as defined below).

7. Interest. Interest will not be paid on any employee accounts, except to the extent that the Board or the Committee, in its sole discretion, elects to credit employee accounts with interest at such rate as it may from time to time determine.

8. Withdrawal of Funds. An employee may at any time prior to the close of business on the fifteenth business day prior to the end of a Plan Period and for any reason permanently draw out the balance accumulated in the employee’s account and thereby withdraw from participation in an Offering. Partial withdrawals are not permitted. The employee may not begin participation again during the remainder of the Plan Period during which the employee withdrew his or her balance. The employee may participate in any subsequent Offering in accordance with terms and conditions established by the Board or the Committee.

9. Purchase of Shares.

(a) Number of Shares. On the Offering Commencement Date, the Company will grant to each eligible employee who is then a participant in the Plan an option (an "Option") to purchase on the last business day of such Plan Period (the "Exercise Date") at the applicable purchase price (the "Option Price") up to that number of shares of Common Stock determined by multiplying \$2,083 by the number of full months in the Plan Period and dividing the result by the closing price (as determined below) on the Offering Commencement Date; provided, however, that no employee may be granted an Option which permits his or her rights to purchase Common Stock under this Plan and any other employee stock purchase plan (as defined in Section 423(b) of the Code) of the Company and its subsidiaries, to accrue at a rate which exceeds \$25,000 of the fair market value of such Common Stock (determined at the date such Option is granted) for each calendar year in which the Option is outstanding at any time; and, provided, further, however, that the Committee may, in its discretion, set a fixed maximum number of shares of Common Stock that each eligible employee may purchase per Plan Period which number may not be greater than the number of shares of Common Stock determined by using the formula in the first clause of this Section 9(a) and which number shall be subject to the second clause of this Section 9(a).

(b) Option Price. The Board or the Committee shall determine the Option Price for each Plan Period, including whether such Option Price shall be determined based on the lesser of the closing price of the Common Stock on (i) the first business day of the Plan Period or (ii) the Exercise Date, or shall be based solely on the closing price of the Common Stock on the Exercise Date; provided, however, that such Option Price shall be at least 85% of the applicable closing price. In the absence of a determination by the Board or the Committee, the Option Price will be 85% of the lesser of the closing price of the Common Stock on (i) the first business day of the Plan Period or (ii) the Exercise Date. The closing price shall be (a) the closing price (for the primary trading session) on any national securities exchange on which the Common Stock is listed or (b) the average of the closing bid and asked prices in the over-the-counter-market, whichever is applicable, as published in The Wall Street Journal or another source selected by the Board or the Committee. If no sales of Common Stock were made on such a day, the price of the Common Stock shall be the reported price for the next preceding day on which sales were made.

(c) Exercise of Option. Each employee who continues to be a participant in the Plan on the Exercise Date shall be deemed to have exercised his or her Option at the Option Price on such date and shall be deemed to have purchased from the Company the number of whole shares of Common Stock reserved for the purpose of the Plan that his or her accumulated payroll deductions on such date will pay for, but not in excess of the maximum numbers determined in the manner set forth above.

(d) Return of Unused Payroll Deductions. Any balance remaining in an employee's payroll deduction account at the end of a Plan Period will be automatically refunded to the employee, except that any balance that is less than the purchase price of one share of Common Stock will be carried forward into the employee's payroll deduction account for the following Offering, unless the employee elects not to participate in the following Offering under the Plan, in which case the balance in the employee's account shall be refunded.

10. Issuance of Certificates. Certificates representing shares of Common Stock purchased under the Plan may be issued only in the name of the employee, in the name of the employee and another person of legal age as joint tenants with rights of survivorship, or (in the Company's sole discretion) in the name of a brokerage firm, bank, or other nominee holder designated by the employee. The Company may, in its sole discretion and in compliance with

applicable laws, authorize the use of book entry registration of shares in lieu of issuing stock certificates.

11. Rights on Retirement, Death or Termination of Employment. If a participating employee's employment ends before the last business day of a Plan Period, no payroll deduction shall be taken from any pay then due and owing to the employee and the balance in the employee's account shall be paid to the employee. In the event of the employee's death before the last business day of a Plan Period, the Company shall, upon notification of such death, pay the balance of the employee's account (a) to the executor or administrator of the employee's estate or (b) if no such executor or administrator has been appointed to the knowledge of the Company, to such other person(s) as the Company may, in its discretion, designate. If, before the last business day of the Plan Period, the Designated Subsidiary by which an employee is employed ceases to be a subsidiary of the Company, or if the employee is transferred to a subsidiary of the Company that is not a Designated Subsidiary, the employee shall be deemed to have terminated employment for the purposes of this Plan.

12. Optionees Not Stockholders. Neither the granting of an Option to an employee nor the deductions from his or her pay shall make such employee a stockholder of the shares of Common Stock covered by an Option under this Plan until he or she has purchased and received such shares.

13. Options Not Transferable. Options under this Plan are not transferable by a participating employee other than by will or the laws of descent and distribution, and are exercisable during the employee's lifetime only by the employee.

14. Application of Funds. All funds received or held by the Company under this Plan may be combined with other corporate funds and may be used for any corporate purpose.

15. Adjustment for Changes in Common Stock and Certain Other Events.

(a) Changes in Capitalization. In the event of any stock split, reverse stock split, stock dividend, recapitalization, combination of shares, reclassification of shares, spin-off or other similar change in capitalization or event, or any dividend or distribution to holders of Common Stock other than an ordinary cash dividend, (i) the number and class of securities available under this Plan, (ii) the share limitations set forth in Section 9, and (iii) the Option Price shall be equitably adjusted to the extent determined by the Board or the Committee.

(b) Reorganization Events.

(i) Definition. A "Reorganization Event" shall mean: (a) any merger or consolidation of the Company with or into another entity as a result of which all of the Common Stock of the Company is converted into or exchanged for the right to receive cash, securities or other property or is cancelled, (b) any transfer or disposition of all of the Common Stock of the Company for cash, securities or other property pursuant to a share exchange or other transaction or (c) any liquidation or dissolution of the Company.

(ii) Consequences of a Reorganization Event on Options. In connection with a Reorganization Event, the Board or the Committee may take any one or more of the following actions as to outstanding Options on such terms as the Board or the Committee determines: (i) provide that Options shall be assumed, or substantially equivalent Options shall be substituted, by the acquiring or succeeding corporation (or an affiliate thereof), (ii) upon written notice to employees, provide that all outstanding Options will be terminated immediately

prior to the consummation of such Reorganization Event and that all such outstanding Options will become exercisable to the extent of accumulated payroll deductions as of a date specified by the Board or the Committee in such notice, which date shall not be less than ten (10) days preceding the effective date of the Reorganization Event, (iii) upon written notice to employees, provide that all outstanding Options will be cancelled as of a date prior to the effective date of the Reorganization Event and that all accumulated payroll deductions will be returned to participating employees on such date, (iv) in the event of a Reorganization Event under the terms of which holders of Common Stock will receive upon consummation thereof a cash payment for each share surrendered in the Reorganization Event (the "Acquisition Price"), change the last day of the Plan Period to be the date of the consummation of the Reorganization Event and make or provide for a cash payment to each employee equal to (A) (1) the Acquisition Price times (2) the number of shares of Common Stock that the employee's accumulated payroll deductions as of immediately prior to the Reorganization Event could purchase at the Option Price, where the Acquisition Price is treated as the fair market value of the Common Stock on the last day of the applicable Plan Period for purposes of determining the Option Price under Section 9(b) hereof, and where the number of shares that could be purchased is subject to the limitations set forth in Section 9(a), minus (B) the result of multiplying such number of shares by such Option Price, (v) provide that, in connection with a liquidation or dissolution of the Company, Options shall convert into the right to receive liquidation proceeds (net of the Option Price thereof) and (vi) any combination of the foregoing.

For purposes of clause (i) above, an Option shall be considered assumed if, following consummation of the Reorganization Event, the Option confers the right to purchase, for each share of Common Stock subject to the Option immediately prior to the consummation of the Reorganization Event, the consideration (whether cash, securities or other property) received as a result of the Reorganization Event by holders of Common Stock for each share of Common Stock held immediately prior to the consummation of the Reorganization Event (and if holders were offered a choice of consideration, the type of consideration chosen by the holders of a majority of the outstanding shares of Common Stock); provided, however, that if the consideration received as a result of the Reorganization Event is not solely common stock of the acquiring or succeeding corporation (or an affiliate thereof), the Company may, with the consent of the acquiring or succeeding corporation, provide for the consideration to be received upon the exercise of Options to consist solely of such number of shares of common stock of the acquiring or succeeding corporation (or an affiliate thereof) that the Board determines to be equivalent in value (as of the date of such determination or another date specified by the Board) to the per share consideration received by holders of outstanding shares of Common Stock as a result of the Reorganization Event.

16. Amendment of the Plan. The Board may at any time, and from time to time, amend or suspend this Plan or any portion thereof, except that (a) if the approval of any such amendment by the shareholders of the Company is required by Section 423 of the Code, such amendment shall not be effected without such approval, and (b) in no event may any amendment be made that would cause the Plan to fail to comply with Section 423 of the Code.

17. Insufficient Shares. If the total number of shares of Common Stock specified in elections to be purchased under any Offering plus the number of shares purchased under previous Offerings under this Plan exceeds the maximum number of shares issuable under this Plan, the Board or the Committee will allot the shares then available on a pro-rata basis.

18. Termination of the Plan. This Plan may be terminated at any time by the Board. Upon termination of this Plan all amounts in the accounts of participating employees shall be promptly refunded.

19. Governmental Regulations. The Company's obligation to sell and deliver Common Stock under this Plan is subject to listing on a national stock exchange (to the extent the Common Stock is then so listed or quoted) and the approval of all governmental authorities required in connection with the authorization, issuance or sale of such stock.

20. Governing Law. The Plan shall be governed by Delaware law except to the extent that such law is preempted by federal law.

21. Issuance of Shares. Shares may be issued upon exercise of an Option from authorized but unissued Common Stock, from shares held in the treasury of the Company, or from any other proper source.

22. Notification upon Sale of Shares. Each employee agrees, by participating in the Plan, to promptly give the Company notice of any disposition of shares purchased under the Plan where such disposition occurs within two years after the date of grant of the Option pursuant to which such shares were purchased.

23. Grants to Employees in Foreign Jurisdictions. The Company may, to comply with the laws of a foreign jurisdiction, grant Options to employees of the Company or a Designated Subsidiary who are citizens or residents of such foreign jurisdiction (without regard to whether they are also citizens of the United States or resident aliens (within the meaning of Section 7701(b)(1)(A) of the Code)) with terms that are less favorable (but not more favorable) than the terms of Options granted under the Plan to employees of the Company or a Designated Subsidiary who are resident in the United States. Notwithstanding the preceding provisions of this Plan, employees of the Company or a Designated Subsidiary who are citizens or residents of a foreign jurisdiction (without regard to whether they are also citizens of the United States or resident aliens (within the meaning of Section 7701(b)(1)(A) of the Code)) may be excluded from eligibility under the Plan if (a) the grant of an Option under the Plan to a citizen or resident of the foreign jurisdiction is prohibited under the laws of such jurisdiction or (b) compliance with the laws of the foreign jurisdiction would cause the Plan to violate the requirements of Section 423 of the Code. The Company may add one or more appendices to this Plan describing the operation of the Plan in those foreign jurisdictions in which employees are excluded from participation or granted less favorable Options.

24. Authorization of Sub-Plans. The Board may from time to time establish one or more sub-plans under the Plan with respect to one or more Designated Subsidiaries, provided that such sub-plan complies with Section 423 of the Code.

25. Withholding. If applicable tax laws impose a tax withholding obligation, each affected employee shall, no later than the date of the event creating the tax liability, make provision satisfactory to the Board for payment of any taxes required by law to be withheld in connection with any transaction related to Options granted to or shares acquired by such employee pursuant to the Plan. The Company may, to the extent permitted by law, deduct any such taxes from any payment of any kind otherwise due to an employee.

26. Effective Date and Approval of Shareholders. The Plan shall take effect as of the immediately prior to the effectiveness of the Company's registration statement with respect to its initial public offering, subject to approval by the shareholders of the Company as required by Section 423 of the Code, which approval must occur within twelve months of the adoption of the Plan by the Board.

Adopted by the Board of Directors on September 27, 2017

Approved by the stockholders on
November 3, 2017

First Amendment and Restatement approved by the Board of Directors on
March 2, 2023

First Amendment and Restatement approved by the stockholders on _____,
2023



X4 PHARMACEUTICALS, INC.
61 N. BACON STREET
4TH FLOOR
BOSTON, MA 02134



SCAN TO
VIEW MATERIALS & VOTE



VOTE BY INTERNET - www.pconproxy.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 12, 2023. 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.

ELECTRONIC DELIVERY OF FUTURE PROXY MATERIALS
If you would like to reduce the costs incurred by our company in mailing proxy materials,
you can consent to receiving all future proxy statements, proxy cards and annual reports
electronically via e-mail or the Internet. To sign up for electronic delivery, please follow the
instructions above to vote using the Internet and, when prompted, indicate that you agree
to receive or access proxy materials electronically in future years.

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 12, 2023. 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 by 11:59 p.m. Eastern Time on June 12, 2023.

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

V15973-P92314

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

THIS PROXY CARD IS VALID ONLY WHEN SIGNED AND DATED.

X4 PHARMACEUTICALS, INC.		For All	Withhold All	For All Except	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.
The Board of Directors recommends a vote FOR the nominees listed in proposal 1.					
1.	To elect three (3) nominees, Gary J. Bridge, Ph.D., Francoise de Craecker and Murray Stewart, M.D., to the Board of Directors to hold office until the 2026 Annual Meeting of Stockholders and until their successors are duly elected and qualified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Nominees:					
01) Gary J. Bridge, Ph.D.					
02) Francoise de Craecker					
03) Murray Stewart, M.D.					
The Board of Directors recommends a vote FOR proposals 2 and 3.		For Against Abstain			
2.	To ratify the selection by the Audit Committee of the Board of Directors of PricewaterhouseCoopers LLP as the independent registered public accounting firm of the Company for its fiscal year ending December 31, 2023.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3.	To hold an advisory "say-on-pay" vote on the Company's executive compensation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
The Board of Directors recommends a vote for "ONE YEAR" for proposal 4.		1 Year 2 Years 3 Years Abstain			
4.	To hold an advisory vote on the frequency of future advisory votes on executive compensation ("say-on-frequency").	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Board of Directors recommends a vote FOR proposal 5.		For Against Abstain			
5.	To approve the Company's Amended and Restated 2017 Employee Stock Purchase Plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
NOTE: Such other business as may properly come before the meeting or any adjournment thereof.					
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.					
<input type="text"/>		<input type="text"/>			
Signature [PLEASE SIGN WITHIN BOX]		Signature (Joint Owners)			
<input type="text"/>		<input type="text"/>			
Date		Date			

Important Notice Regarding the Availability of Proxy Materials for the Annual Meeting:
The Notice and Proxy Statement and Annual Report are available at www.proxyvote.com.

V15974-P92314



**Proxy for Annual Meeting of Stockholders to be held
on Tuesday, June 13, 2023 at 12:00 PM EDT**

This proxy is being solicited on behalf of the Board of Directors

Please vote, date and sign this Proxy on the reverse side and return it in the enclosed envelope.

The Stockholder(s) signing on the reverse side (the "undersigned"), having received the Annual Report and Proxy Statement, hereby appoint(s) Paula Ragan and Adam Mostafa, and either of them, Proxies of the undersigned (with full power of substitution) to attend the Annual Meeting of X4 Pharmaceuticals, Inc. (the "Company") to be held on Tuesday, June 13, 2023 at 12:00 PM EDT, at the offices of Cooley LLP, 500 Boylston Street, 14th Floor, Boston, Massachusetts 02116, and all adjournments and postponements thereof (the "Meeting"), and to vote all shares of Common Stock of the Company that the undersigned would be entitled to vote, if personally present, in regard to all matters that may properly come before the Meeting.

The undersigned hereby confer(s) upon the Proxies, and either of them, discretionary authority to consider and act upon such business, matters or proposals as may properly come before the Meeting. **The Proxy, when properly executed, will be voted in the manner specified herein. If no specification is made, the Proxies intend to vote FOR all nominees for director in Proposal 1; FOR Proposals 2, 3 and 5; and ONE YEAR for Proposal 4.**

Continued and to be signed on reverse side.