geron

2022 Annual Report

Letter to Stockholders
Proxy
10-K

DEAR GERON STOCKHOLDER,

We took a significant step forward in our mission to enhance the lives of patients living with hematologic malignancies with the announcement of positive top-line results (TLR) from our IMerge Phase 3 clinical trial. These data, reported in January 2023, confirmed the efficacy and safety results from our Phase 2 trial and provided continued strong evidence of the potential disease modification achievable with imetelstat, our first-in-class telomerase inhibitor. Imetelstat harnesses Nobel Prize-winning science in a treatment that may alter the underlying drivers of hematologic malignancies, which we believe would clearly distinguish imetelstat as a potential treatment option in these diseases.

The robust and clinically meaningful TLR data now spurs the next steps in the journey to bring imetelstat to lower risk myelodysplastic syndromes (MDS) patients. These steps include obtaining regulatory approvals for imetelstat and then commercially launching the drug. Successful accomplishment of these important milestones will also grow and broaden Geron's capabilities as we transition from a development stage to a commercial stage company. We expect these efforts to provide meaningful benefit to patients and to translate significant value for our stockholders. We appreciate our many long-time stockholders who have supported Geron and imetelstat since the beginning and continue to believe in the potential impact that imetelstat could make for patients.

For the remainder of my letter, I will outline our plans for 2023 which we believe may extend the journeys of both telomerase inhibition and imetelstat, as we seek additional clinically meaningful outcomes for patients with hematologic malignancies and potentially transform current treatment paradigms.

Imetelstat for Lower Risk MDS Patients
Based on the positive TLR from IMerge Phase 3, we plan to submit a New Drug Application to the U.S. Food and Drug Administration in mid-2023 and a Marketing Authorization Application to the European Medicines Agency in the second half of 2023. In parallel, we are preparing for a potential U.S. commercial launch in the first half of 2024 and a potential EU commercial launch by the end of 2024.

To support the potential approvals and launches of imetelstat, we are focused on Geron's organizational evolution to a commercial entity. This effort involves building and expanding the support functions across Geron, including information technology, human resources, finance and legal. Further, we are expanding our commercial capabilities with the hiring of seasoned professionals across medical affairs, market access, marketing and sales.

Imetelstat for Relapsed/Refractory Myelofibrosis Patients
Our second Phase 3 clinical program, the IMpactMF trial in intermediate-2 (Int-2) or high-risk (HR) myelofibrosis (MF) relapsed/refractory to JAK inhibitors (JAKi), is the first and only Phase 3 MF trial with overall survival (OS) as the primary endpoint. In 2023, patient recruitment, enrollment and treatment will be ongoing. We expect the interim analysis for IMpactMF to occur in 2024 and the final analysis to occur in 2025, based on current planning assumptions around enrollment and median OS estimates for each treatment arm. These analyses are event-driven, and it is uncertain whether actual rates for enrollment and death events will reflect current assumptions. If the improvement in OS that was observed in imetelstat-treated patients in our IMbark Phase 2 trial can be confirmed in the Phase 3 IMpactMF trial, we believe imetelstat will be strongly differentiated from other treatments in MF currently approved or in development and will likely change the treatment paradigm for relapsed/refractory MF patients.

Additional Programs to Broaden Opportunities for Imetelstat and Telomerase Inhibition
In August 2022, we dosed the first patient in the IMproveMF Phase 1 combination study in frontline MF. This trial is intended to explore the potential for disease modification with imetelstat in the earlier, frontline MF setting. The design of the study is based on preclinical data which showed synergistic and additive effects of the combination of imetelstat and ruxolitinib. Two of the three trial sites for this study are open for patient enrollment, and we expect to present preliminary results from this study by the end of 2023.

We are also supporting the IMpress investigator-led study of single-agent imetelstat in relapsed/refractory acute myeloid leukemia (AML) and higher risk MDS for patients who were already treated with a hypomethylating agent. The first site is planned to open in 2023—if the initial IMpress data show promise for imetelstat in higher risk MDS and AML, we expect to support another investigator-led study evaluating the combination of imetelstat plus other drugs that are part of the standard of care for such patients.

With regards to our preclinical efforts, in November 2022, early data from the lymphoid malignancies program being conducted at MD Anderson Cancer Center were published. Based on these early preclinical results, we are continuing the collaboration to assess the potential therapeutic effect of imetelstat in lymphoid malignancies and expect further data by the end of 2023.

Lastly, the objective of our discovery program is to identify a lead compound as a potential next generation oral telomerase inhibitor. We continue to investigate various chemical entities as potential scaffolds. We expect completion of the current discovery effort in 2023, upon which we plan to potentially advance any lead compounds to the next step of discovery research. If successful, these efforts would permit initiation of nonclinical studies to enable an Initial New Drug Application in the future.

In summary, we are excited by the future and the prospect to achieve our vision of becoming a leader in the treatment of hematologic malignancies. We look forward to 2023 being a pivotal year for Geron, as we advance development of imetelstat to create value for patients and stockholders alike.

Thank you for your continued support.

Sincerely,

John A. Scarlett, M.D.
Chairman and Chief Executive Officer

For important information regarding the use of forward-looking statements in this letter to stockholders, please refer to the inside back cover of this annual report.

GERON CORPORATION
919 E. Hillsdale Blvd., Suite 250
Foster City, CA 94404

NOTICE OF ANNUAL MEETING OF STOCKHOLDERS
To Be Held on May 31, 2023

To the Stockholders of Geron Corporation:

NOTICE IS HEREBY GIVEN that the Annual Meeting of Stockholders of GERON CORPORATION, a Delaware corporation (the "Company"), will be held on Wednesday, May 31, 2023, at 8:00 a.m., Pacific Daylight Time. To facilitate stockholder participation in the Annual Meeting, we have determined that the Annual Meeting will be held in a virtual meeting format only, via the Internet, with no physical in-person meeting. You can attend the virtual Annual Meeting online, vote your shares electronically and submit your questions during the virtual Annual Meeting, by visiting www.virtualshareholdermeeting.com/GERN2023. You will need to have your 16-Digit Control Number included in the Notice of Internet Availability of Proxy Materials, on your proxy card or on the instructions that accompanied your proxy materials to join the virtual Annual Meeting.

The Annual Meeting will be held for the following purposes:

1. To elect the two nominees for director named in the accompanying proxy statement (the "Proxy Statement") to hold office as Class III members of the Board of Directors until the 2026 annual meeting of stockholders;
2. To approve an amendment to the Company's Restated Certificate of Incorporation to increase the total number of authorized shares of the Company's common stock from 675,000,000 to 1,350,000,000 shares;
3. To approve amendments to the Company's 2018 Equity Incentive Plan to, among other items, (i) increase the number of shares of the Company's common stock issuable thereunder by 43,360,000 shares and (ii) modify the fungible plan design;
4. To approve, on an advisory basis, the preferred frequency of holding future advisory votes on executive compensation;
5. To approve, on an advisory basis, the compensation of our named executive officers, as disclosed in the Proxy Statement;
6. To ratify the selection by the Audit Committee of the Board of Directors of Ernst & Young LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2023; and
7. To transact such other business as may properly come before the Annual Meeting or any postponement or adjournment thereof.

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

The Board of Directors has fixed the close of business on April 6, 2023, as the record date for the determination of stockholders entitled to notice of and to vote at the virtual Annual Meeting and at any adjournment or postponement thereof. Each stockholder is entitled to one vote for each share of common stock held at that time.

Your Vote Is Important To Us. Whether or not you plan to attend the virtual Annual Meeting, please vote electronically via the Internet or by telephone, or, if you requested paper copies of the proxy materials, please complete, sign, date and return the accompanying proxy card in the enclosed postage-paid envelope, as promptly as possible. Stockholders who plan to attend the virtual Annual Meeting should follow the instructions at www.virtualshareholdermeeting.com/GERN2023 to submit questions and vote during the virtual Annual Meeting. You may log-in beginning at 7:30 a.m. Pacific Daylight Time, on May 31, 2023. **You will not be able to attend the meeting in person.**

By Order of the Board of Directors,

Stephen N. Rosenfield
Executive Vice President,
Chief Legal Officer and Corporate Secretary

Foster City, California
April 12, 2023

Important Notice Regarding the Availability of Proxy Materials for the Annual Meeting to Be Held on May 31, 2023 at www.virtualshareholdermeeting.com/GERN2023
Letter to Stockholders, Notice and 2023 Proxy Statement, and 2022 Annual Report on Form 10-K are available at www.proxyvote.com.

YOUR VOTE IS VERY IMPORTANT, REGARDLESS OF THE NUMBER OF SHARES YOU OWN. WHETHER OR NOT YOU EXPECT TO ATTEND THE VIRTUAL ANNUAL MEETING, WE URGE YOU TO SUBMIT YOUR PROXY PROMPTLY IN ORDER TO ASSURE THAT A QUORUM IS PRESENT. EVEN IF YOU HAVE VOTED BY PROXY, YOU MAY STILL VOTE ONLINE IF YOU ATTEND THE VIRTUAL ANNUAL MEETING. PLEASE NOTE, HOWEVER, THAT IF YOUR SHARES ARE HELD OF RECORD BY A BROKER, BANK OR OTHER NOMINEE AND YOU WISH TO VOTE AT THE VIRTUAL ANNUAL MEETING, YOU MUST OBTAIN A PROXY ISSUED IN YOUR NAME FROM THAT RECORD HOLDER.

TABLE OF CONTENTS

GERON CORPORATION
919 E. Hillsdale Blvd., Suite 250
Foster City, CA 94404

PROXY STATEMENT
FOR THE ANNUAL MEETING OF STOCKHOLDERS
TO BE HELD ON MAY 31, 2023

QUESTIONS AND ANSWERS ABOUT THESE PROXY MATERIALS AND VOTING

Why am I receiving these materials?

You are receiving this annual meeting information and Proxy Statement from us because you owned shares of common stock, par value $0.001 per share, ("Common Stock") of Geron Corporation, a Delaware corporation ("Geron," the "Company," "we" or "us"), as of April 6, 2023, the record date for our 2023 Annual Meeting of Stockholders (the "Annual Meeting"). The Geron Board of Directors (the "Board of Directors" or the "Board") has made these materials available to you in connection with the Board's solicitation of proxies for use at the Annual Meeting. You may vote by proxy over the Internet or by phone, or by mail if you requested printed copies of the proxy materials.

As permitted by the rules of the Securities and Exchange Commission (the "SEC"), we are providing our stockholders access to proxy materials via the Internet. Accordingly, we are sending by mail only a Notice of Availability of Proxy Materials (the "Notice") to certain of our stockholders of record and posting our proxy materials online at www.proxyvote.com. Stockholders who previously requested to receive hard copies of proxy materials will receive a full set of proxy materials, instead of the Notice. We intend to distribute the Notice and the proxy materials on or about April 20, 2023 to all stockholders of record entitled to vote at the Annual Meeting.

What does it mean if I receive more than one set of proxy materials or more than one Notice, or combination thereof?

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

Will I receive any proxy materials by mail other than the Notice?

No, you will not receive any other proxy materials by mail other than the Notice unless you request paper copies. Pursuant to rules adopted by the SEC, we have elected to use the Internet as the primary means of furnishing proxy materials to our stockholders. This method allows us to deliver the proxy materials to you more quickly, lowers our costs significantly, and helps to conserve natural resources. We encourage stockholders to take advantage of the option to receive proxy materials electronically by email to help reduce the environmental impact of our annual meeting and to reduce costs associated with the physical printing and mailing of materials. This Proxy Statement and our Annual Report on Form 10-K for the year ended December 31, 2022 are also available at www.proxyvote.com. You may request a full set of proxy materials be sent to your specified postal or email address as follows:

- by telephone: call 1-800-579-1639 free of charge and follow the instructions;
- by Internet: go to www.proxyvote.com and follow the instructions; or
- by e-mail: send an e-mail message to sendmaterial@proxyvote.com. Please send a blank e-mail and insert the 16-Digit Control Number located in your Notice in the subject line. Please make any such request on or before May 1, 2023 to facilitate timely delivery.

To sign up for electronic delivery of proxy materials, please follow the instructions provided with your proxy materials and on your proxy card or voting instruction card, to vote using the Internet and, when prompted, indicate that you agree to receive or access future stockholder communications electronically. Alternatively, you can go to www.proxyvote.com and enroll for online delivery of proxy materials. A stockholder's election to receive proxy materials by mail or electronically by email will remain in effect until the stockholder terminates such election.

What is the purpose of the Annual Meeting?

At our Annual Meeting, stockholders will act upon the matters described in this Proxy Statement. In addition, management will report on current events at Geron and respond to questions from stockholders.

How can I participate in the Annual Meeting?

In light of the continued COVID-19 pandemic, for the safety of all our stockholders and to facilitate stockholder participation in the Annual Meeting, we will be holding our Annual Meeting virtually, on Wednesday, May 31, 2023, at 8:00 a.m., Pacific Daylight Time, via the Internet at www.virtualshareholdermeeting.com/GERN2023. Online check-in will begin at 7:30 a.m. Pacific Daylight Time and you should allow ample time for the check-in procedures. At our virtual Annual Meeting, stockholders will be able to attend, vote and submit questions via the Internet. Whether or not you plan to attend the virtual Annual Meeting, we urge you to vote and submit your proxy in advance of the meeting by one of the methods described in these proxy materials.

You will not be able to attend the virtual Annual Meeting in person.

How do I ask questions at the virtual Annual Meeting?

Our virtual Annual Meeting allows stockholders to submit questions and comments before and during the virtual Annual Meeting. You may submit questions before the virtual Annual Meeting at www.virtualshareholdermeeting.com/GERN2023. During the virtual Annual Meeting, you may only submit questions in the question box provided at www.virtualshareholdermeeting.com/GERN2023. In both cases, stockholders must have available their 16-Digit Control Number provided in the Notice or your proxy card (if you received a printed copy of the proxy materials). We will respond to as many inquiries at the virtual Annual Meeting as time allows.

What if during the check-in time or during the virtual Annual Meeting I have technical difficulties or trouble accessing the virtual meeting website?

We will have technicians ready to assist you with any technical difficulties you may have accessing the virtual meeting website. If you encounter any difficulties accessing the virtual Annual Meeting during the check-in or meeting time, please call the technical support number that will be posted on the virtual Annual Meeting website log-in page.

What if I cannot virtually attend the Annual Meeting?

You may vote your shares electronically before the virtual Annual Meeting by Internet, or by telephone or by mail as described below. You do not need to access the virtual Annual Meeting to vote if you submitted your vote by Internet, by telephone or by mail in advance of the virtual Annual Meeting.

The virtual Annual Meeting will be archived for one year after the date of the virtual Annual Meeting at www.virtualshareholdermeeting.com/GERN2023.

Who can vote at the virtual Annual Meeting?

Only holders of record at the close of business on April 6, 2023 (the "Record Date") will be entitled to notice of and to vote at the virtual Annual Meeting or any adjournment or postponement thereof. At the close of business on the Record Date, we had 508,731,846 shares of Common Stock outstanding.

Stockholder of Record: Shares Registered in Your Name

Each holder of record of Common Stock on the Record Date will be entitled to one vote for each share held on all matters to be voted upon at the virtual Annual Meeting. As a stockholder of record, you may vote at the virtual Annual Meeting, or prior to the virtual Annual Meeting, vote through the Internet or by telephone, or by mail using a proxy card that you received or that you may request. Whether or not you plan to attend the virtual Annual Meeting, we urge you vote by proxy through the Internet or by telephone as instructed below, or by completing a proxy card that you may request or that we may elect to deliver at a later time. Stockholders who attend the virtual Annual Meeting should follow the instructions at www.virtualshareholdermeeting.com/GERN2023 to vote during the virtual Annual Meeting. The stock transfer books will not be closed between the Record Date and the virtual Annual Meeting date. A complete list of

stockholders entitled to vote at the virtual Annual Meeting will be available for examination at our principal executive offices at the address listed above for a period of ten days prior to the virtual Annual Meeting and will be available on the virtual meeting site at www.virtualshareholdermeeting.com/GERN2023.

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

If on the Record Date your shares were held, not in your name, but rather in an account at a brokerage firm, bank, dealer 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 during the virtual Annual Meeting. As a beneficial owner, you have the right to direct your broker or other agent regarding how to vote the shares in your account. You are also invited to attend the virtual Annual Meeting. However, since you are not the stockholder of record, you may only vote your shares during the virtual Annual Meeting if you request and obtain a valid 16-Digit Control Number from your broker or agent. Beneficial owners who attend the virtual Annual Meeting should follow the instructions at www.virtualshareholdermeeting.com/GERN2023 to vote during the virtual Annual Meeting.

What is the quorum requirement?

A quorum of stockholders is necessary to hold a valid meeting. In order to constitute a quorum and to transact business at the virtual Annual Meeting, the holders of a majority of the Common Stock issued and outstanding and entitled to vote must be present in person or represented by proxy. Virtual attendance at our Annual Meeting constitutes presence in person for purposes of a quorum at the meeting. Shares represented by proxies that reflect abstentions or "broker non-votes" will be counted as shares that are present and entitled to vote for purposes of determining the presence of a quorum.

What am I voting on at the virtual Annual Meeting? What is the Board's recommendation on each of the proposals?

You are being asked to vote on six proposals, as follows:

Proposal Number	Proposal	Board Recommends
1	To elect the two nominees for director named in this Proxy Statement to hold office as Class III members of our Board of Directors until the 2026 annual meeting of stockholders.	**FOR BOTH director nominees**
2	To approve an amendment to our Restated Certificate of Incorporation to increase the total number of authorized shares of our Common Stock from 675,000,000 to 1,350,000,000 shares.	**FOR**
3	To approve amendments to our 2018 Equity Incentive Plan to, among other items, increase the total number of shares of Common Stock issuable thereunder by 43,360,000 shares and modify the fungible plan design.	**FOR**
4	To approve, on an advisory basis, the preferred frequency of holding future advisory votes on executive compensation.	**EVERY 1 YEAR**
5	To approve, on an advisory basis, the compensation of our named executive officers, as disclosed in this Proxy Statement.	**FOR**
6	To ratify the selection by the Audit Committee of the Board of Directors of Ernst & Young LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2023.	**FOR**

How many votes are needed to approve each proposal? What is the effect of abstentions and broker non-votes on each of the proposals?

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

Proposal Number	Proposal	Votes Required to Approve Proposal[1]	Effect of Abstentions	Effect of Broker Non-Votes
1	To elect the two nominees for director named in this Proxy Statement to hold office as Class III members of our Board of Directors until the 2026 annual meeting of stockholders.	The nominees receiving the most "FOR" votes properly cast in person or represented by proxy will be elected. Only votes "FOR" will affect the outcome of the vote; "WITHHOLD" votes will have no effect on the outcome of the vote. However, under our Corporate Governance Guidelines, any nominee for director who receives a greater number of "WITHHOLD" votes from his or her election than votes "FOR" such election is required to submit an offer of resignation for consideration by the Nominating and Corporate Governance Committee. In such case, the Nominating and Corporate Governance Committee will then consider all of the relevant facts and circumstances and recommend to the Board the action to be taken with respect to such offer of resignation.	Not applicable	No effect
2	To approve an amendment to our Restated Certificate of Incorporation to increase the total number of authorized shares of our Common Stock from 675,000,000 to 1,350,000,000 shares.	The affirmative vote of the holders of a majority of the outstanding shares entitled to vote on this matter.	Against	Against [2]
3	To approve amendments to our 2018 Equity Incentive Plan to, among other items, increase the total number of shares of our Common Stock issuable thereunder by 43,360,000 shares and modify the fungible plan design.	The affirmative vote of the holders of a majority of the shares having voting power present in person or represented by proxy at the Annual Meeting.	Against	No effect
4	To approve, on a non-binding and advisory basis, the preferred frequency of holding future advisory votes on executive compensation.	The option of every one, two or three years that receives the votes of the holders of a majority of the shares having voting power present in person or represented by proxy at the Annual Meeting will be considered the frequency approved by our stockholders.	(3)	No effect
5	To approve, on an advisory basis, the compensation of our named executive officers, as disclosed in this Proxy Statement.	The affirmative vote of the holders of a majority of the shares having voting power present in person or represented by proxy at the Annual Meeting.	Against	No effect
6	To ratify the selection by the Audit Committee of the Board of Directors of Ernst & Young LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2023.	The affirmative vote of the holders of a majority of the shares having voting power present in person or represented by proxy at the Annual Meeting.	Against	Not applicable [4]

(1) Virtual attendance at our Annual Meeting constitutes presence in person for purposes of the votes.

(2) While similar proposals are typically considered to be "routine" matters under New York Stock Exchange ("NYSE") rules, we have been advised by the NYSE that this proposal is considered to be a "non-routine" matter under NYSE rules given our current lack of sufficient unissued and unreserved shares of Common Stock to effect the proposed share increase under our 2018 Equity Incentive Plan as described in Proposal 3 (Proposal 3 is also considered to be a non-routine matter). Accordingly, we expect broker non-votes to exist with respect to this proposal. For more information, see "If I am a beneficial owner of shares held in street name and I do not provide my broker or bank with my voting instructions, what happens?" and "What are broker non-votes?" below.

(3) Abstentions will be counted towards the vote total, but will not be counted as a vote in favor of any of the frequency options, and thus will have the effect of reducing the likelihood that any frequency receives a majority vote.

(4) The NYSE has advised us that this proposal 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 applicable NYSE rules to vote your shares on this proposal. For more information, see "If I am a beneficial owner of shares held in street name and I do not provide my broker or bank with my voting instructions, what happens?" and "What are broker non-votes?" below.

What are the choices in voting?

For Proposal 1, you may either vote "FOR" both nominees to the Board of Directors or you may "WITHHOLD" your vote for one or more nominees that you specify. For proposals 2, 3, 5 and 6, you may vote "FOR" the proposal or "AGAINST" the proposal or "ABSTAIN" from voting on the proposal. For Proposal 4, you may vote to hold an advisory vote on executive compensation every "1 YEAR", "2 YEARS" or "3 YEARS", or you may "ABSTAIN" from voting on the proposal.

Could other matters be decided at the virtual Annual Meeting?

Our Bylaws require that we receive advance notice of any proposal to be brought before the Annual Meeting by our stockholders, and we have not received notice of any such proposals. If any other matters were to be properly submitted for a vote at the virtual Annual Meeting, the proxy holders appointed by the Board will have the discretion to vote on those matters for you as they see fit. This includes, among other things, considering any motion to adjourn the virtual Annual Meeting to another time and/or place, including for the purpose of soliciting additional proxies for or against a given proposal.

How do I vote my shares and what are the voting deadlines?

Please refer to the proxy card for instructions on, and access information for, voting by telephone, over the Internet or by mail.

Stockholder of Record: Shares Registered In Your Name

You are a stockholder of record if, on the Record Date, your shares were registered directly in your name with our transfer agent, Computershare Trust Company, N.A. As a stockholder of record, there are several ways for you to vote your shares.

- **Via the Internet Before the Virtual Annual Meeting.** You may vote by Internet at www.proxyvote.com, 24 hours a day, seven days a week. You will need the 16-Digit Control Number included on your Notice, your proxy card (if you received a printed copy of the proxy materials) or the instructions that accompanied your proxy materials to join the virtual Annual Meeting. Votes submitted through the Internet must be received by 11:59 p.m., Eastern Daylight Time, on May 30, 2023.
- **By Telephone.** You may vote using a touch-tone telephone by calling 1-800-690-6903, 24 hours a day, seven days a week. You will need the 16-Digit Control Number included on your Notice, your proxy card (if you received a printed copy of the proxy materials) or the instructions that accompanied your proxy materials to join the virtual Annual Meeting. Votes submitted by telephone must be received by 11:59 p.m., Eastern Daylight Time, on May 30, 2023.
- **By Mail.** If you received printed proxy materials, you may submit your vote by completing, signing, and dating each proxy card received and returning it in the postage-paid envelope. Sign your name exactly as it appears on the proxy card. Proxy cards submitted by mail must be received no later than close of business on May 30, 2023 to be voted at the virtual Annual Meeting.
- **Via the Internet During the Virtual Annual Meeting.** Stockholders who attend the virtual Annual Meeting should follow the instructions at www.virtualshareholdermeeting.com/GERN2023 to vote during the virtual Annual Meeting. You will need the 16-Digit Control Number included on your Notice, your proxy card (if you received a printed copy of the proxy materials) or the instructions that accompanied your proxy materials to join the virtual Annual Meeting.

The Internet and telephone voting procedures described above, which comply with Delaware law, are designed to authenticate stockholders' identities, to allow stockholders to vote their shares, and to confirm that their instructions have been properly recorded. 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.

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

You are a beneficial owner, if on the Record Date, your shares were held in an account at a brokerage firm, bank, dealer, or other similar organization and not in your name. The organization holding your account is considered to be the stockholder of record for purposes of voting at the virtual Annual Meeting. Being a beneficial owner means that, like most stockholders, your shares are held in "street name" and these proxy materials are being forwarded to you by that organization.

As a beneficial owner, you should have received a Notice or voting instructions from the broker or other nominee holding your shares. You should follow the instructions in the Notice or voting instructions provided by your broker or nominee in order to instruct your broker or other nominee on how to vote your shares. The availability of telephone and Internet voting will depend on the voting process of the broker or nominee. Please contact your bank, broker or other agent if you have questions about their instructions on how to vote your shares. Please also note that since you are not the stockholder of record, you may only vote your shares during the virtual Annual Meeting if you request and obtain a valid 16-Digit Control Number from your broker or agent. Beneficial owners who attend the virtual Annual Meeting should follow the instructions at www.virtualshareholdermeeting.com/GERN2023 to vote during the virtual Annual Meeting. You will need the 16-Digit Control Number included on your Notice, your proxy card (if you received a printed copy of the proxy materials) or the instructions that accompanied your proxy materials to join the virtual Annual Meeting.

We have been advised by the NYSE that the ratification of the selection of Ernst & Young LLP as our independent registered public accounting firm for the fiscal year ending December 31, 2023 (Proposal 6) is considered to be a "routine" matter under NYSE rules. Accordingly, if you do not provide your broker or bank with instructions on how to vote your shares, your broker or bank would be able to vote your shares under applicable NYSE rules on Proposal 6. For more information, see "If I am a beneficial owner of shares held in street name and I do not provide my broker or bank with my voting instructions, what happens?" and "What are broker non-votes?"
below.

Geron Plan Participants

As trustee of the Geron 401(k) Plan, Prudential Bank and Trust FSB will receive a proxy that incorporates all the shares owned by the Geron 401(k) Plan and will vote such proxy as directed by the Geron 401(k) sponsor.

If you purchased through the 2014 Employee Stock Purchase Plan and your shares are held in the name of a broker, please refer to the discussion above under "Beneficial Owner: Shares Registered in the Name of a Broker or Bank."

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 you do not specify your vote on each proposal individually when voting via the Internet, over the telephone or if you sign and return a proxy card without giving specific voting instructions, then your shares will be voted in line with the Board's recommendations above as described under "What am I voting on at the virtual Annual Meeting? What is the Board's recommendation on each of the proposals?" If any other matter is properly presented at the virtual 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 my voting instructions, what happens?

If you are a beneficial owner of shares registered in the name of your broker, bank or other agent, 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 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, we have been advised by the NYSE that Proposals 1, 2, 3, 4 and 5 are considered to be "non-routine" under NYSE rules meaning that, under applicable NYSE rules, your broker would not be able to vote your shares on those proposals in the absence of your voting instructions. However, we have been advised by the NYSE that Proposal 6 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, under applicable NYSE rules, your shares may be voted by your broker in its discretion on Proposal 6.

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 proxy materials you receive from your broker, bank or other agent.

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 that is subject to NYSE rules 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 under applicable NYSE rules. These un-voted shares are counted as "broker non-votes." We have been advised by the NYSE that Proposals 1, 2, 3, 4 and 5 are considered to be "non-routine" under NYSE rules, and we therefore expect broker non-votes to exist in connection with those proposals.

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

Can I revoke or change my vote after I submit my proxy?

Stockholder of Record: Shares Registered in Your Name

If you are a stockholder of record, you may revoke or change your vote at any time before the final vote at the virtual Annual Meeting by:

- signing and returning a new proxy card with a later date;
- submitting a later-dated vote by telephone or via the Internet — only your latest Internet or telephone vote received by 11:59 p.m., Eastern Daylight Time, on May 30, 2023, will be counted. You will need the 16-Digit Control Number included on your Notice, your proxy card (if you received a printed copy of the proxy materials) or the instructions that accompanied your proxy materials;
- attending the virtual Annual Meeting and voting again by following the instructions at www.virtualshareholdermeeting.com/GERN2023 to vote during the virtual Annual Meeting. To virtually attend the Annual Meeting, you will need the 16-Digit Control Number included on your Notice, your proxy card (if you received a printed copy of the proxy materials) or the instructions that accompanied your proxy materials; or
- delivering a written revocation to our Corporate Secretary at Geron's offices, 919 E. Hillsdale Blvd., Suite 250, Foster City, California 94404, before the virtual Annual Meeting.

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

If you are a beneficial owner of your shares, you must contact the broker or other nominee holding your shares and follow their instructions for revoking or changing your vote.

How will your proxy be counted?

Votes will be counted by the Inspector of Election appointed for the virtual Annual Meeting, who will separately count "FOR," "WITHHOLD" and broker non-votes with respect to Proposal 1 regarding the election of directors, and, with respect to Proposals 2, 3, 5, and 6, "FOR" and "AGAINST" votes, abstentions and, as applicable, broker non-votes. With respect to Proposal 4, the Inspector of Election will separately count "1 YEAR," "2 YEARS" and "3 YEARS" frequency votes, as well as abstentions and broker non-votes.

Is my vote confidential?

Yes. Proxy cards and voting tabulations that identify stockholders by name are kept confidential. There are exceptions for contested proxy solicitations or when necessary to meet legal requirements. In addition, all comments written on a proxy card or elsewhere will be forwarded to management, but your identity will be kept confidential unless you ask that your name be disclosed.

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

Preliminary voting results will be announced at the virtual Annual Meeting. Final voting results will be published by Geron in a Current Report on Form 8-K, filed with the SEC, that we expect to file within four business days after the virtual Annual Meeting. If final voting results are not available to us in time to file a Current Report on Form 8-K within four business days after the virtual Annual Meeting, we intend to file a Current Report on Form 8-K to publish preliminary results and, within four business days after the final results are known to us, file an additional Current Report on Form 8-K to publish the final results.

Who is paying for this proxy solicitation?

We will pay the entire cost of solicitation of proxies, including preparation, assembly, printing and mailing of this Proxy Statement, the proxy card and any additional information furnished to stockholders. Copies of solicitation materials will be furnished to banks, brokerage houses, fiduciaries and custodians holding in their names shares of Common Stock beneficially owned by others to forward to such beneficial owners. In addition, we may reimburse persons representing beneficial owners of Common Stock for their costs of forwarding solicitation materials to such beneficial owners. The original solicitation of proxies by mail may be supplemented by solicitation by mail, telephone or other electronic means, or in person, by our directors, officers, or other regular employees, or at our request, by Alliance Advisors, LLC. No additional compensation will be paid to directors, officers or other regular employees for such services, but Alliance Advisors will be paid its customary fee, estimated to be $6,500, to render solicitation services.

When are stockholder nominations and proposals due for next year's Annual Meeting?

See the sub-section entitled "Stockholder Nominations and Proposals for 2024 Annual Meeting" under the section entitled "Other Matters."

How can I obtain a copy of Geron's Annual Report on Form 10-K?

We will mail to you without charge, upon written request, a copy of our Annual Report on Form 10-K for the year ended December 31, 2022 filed with the SEC, as well as a copy of any exhibit specifically requested. Requests should be sent to: Corporate Secretary, Geron Corporation, 919 E. Hillsdale Blvd., Suite 250, Foster City, California 94404. A copy of our Annual Report on Form 10-K for the year ended December 31, 2022 has also been filed with the SEC and may be accessed from the SEC's homepage (www.sec.gov). You may also view and download our Annual Report on Form 10-K for the year ended December 31, 2022 from our website at www.geron.com, as well as www.proxyvote.com.

What is householding and how does it affect me?

Some brokers and other nominee record holders may be participating in the practice of "householding" proxy statements. This means that only one copy of this Proxy Statement and Annual Report on Form 10-K for the year ended December 31, 2022 or the Notice may have been sent to multiple stockholders in a stockholder's household. 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 separate copies of the proxy statement, annual report or the notice of internet availability of proxy materials, please notify your broker or our Investor Relations department. We will promptly deliver copies of the Proxy Statement and our Annual Report on Form 10-K for the year ended December 31, 2022 or the Notice to any stockholder who contacts us by electronic mail addressed to investors@geron.com, or by mail addressed to Investor Relations, Geron Corporation, 919 E. Hillsdale Blvd., Suite 250, Foster City, California 94404, requesting such copies. If you receive multiple copies of the proxy statement and annual report at your household and would like to receive a single copy of the proxy statement and annual report for your household in the future, you should contact your broker, other nominee record holder, or our Investor Relations department to request a single copy of the proxy statement and annual report.

Forward-Looking Statements

Except for the historical information contained herein, this Proxy Statement contains forward-looking statements, including, but not limited to: (a) statements relating to the continued development and potential commercialization of imetelstat by Geron; (b) the therapeutic and commercial potential of imetelstat; (c) potential regulatory approvals for imetelstat; (d) plans, considerations, expectations and determinations regarding future compensation decisions; (e) Geron having sufficient cash to fund operations and sufficient unissued and unreserved authorized shares of Common Stock to support growth and the potential commercialization of imetelstat; and (f) other statements that are not historical facts. These statements involve risks and uncertainties that can cause actual results to differ materially from those in such forward-looking statements. These risks and uncertainties, include, without limitation, risks and uncertainties related to: (i) whether regulatory authorities permit the further development of imetelstat for myelodysplastic syndromes and/or myelofibrosis and/or potential additional indications on a timely basis, or at all, without any clinical holds; (ii) whether Geron overcomes all the clinical, safety, efficacy, technical, scientific, intellectual property, manufacturing and regulatory challenges to continue development of imetelstat in any indication; (iii) whether imetelstat is demonstrated to be safe and efficacious in clinical trials; (iv) whether any future efficacy or safety results may cause the benefit-risk profile of imetelstat to become unacceptable; (v) whether Geron can complete the significant additional research, non-clinical testing and clinical testing that will be required before any application with the United States Food and Drug Administration or other regulatory authorities can be submitted or filed for regulatory approval of imetelstat; (vi) whether regulatory authorities will approve imetelstat for commercial sale, in a timely manner or at all; and (vii) Geron's need for substantial additional capital, which may not be available in a timely manner or at all. In addition, the actual executive compensation program that we adopt in the future may differ materially from the current executive compensation program summarized in this Proxy Statement. Additional information on the above-stated risks and uncertainties and additional risks, uncertainties and factors that could cause actual results to differ materially from those in the forward-looking statements are contained in our periodic reports filed with the Securities and Exchange Commission under the heading "Risk Factors," including our Annual Report on Form 10-K for the year ended December 31, 2022 and in our future filings and reports. Undue reliance should not be placed on forward-looking statements, which speak only as of the date of this Proxy Statement and the facts and assumptions underlying the forward-looking statements may change. Except as required by law, we disclaim any obligation to update these forward-looking statements to reflect future information, events or circumstances.

MATTERS TO BE CONSIDERED AT THE 2023 ANNUAL MEETING

PROPOSAL 1

ELECTION OF DIRECTORS

Board Structure

Our Board currently consists of eight directors, seven of whom are "independent," as that term is defined by Nasdaq Rule 5602(a)(2), and one of whom is an executive officer of the Company. Our Bylaws provide for the classification of the Board into three classes with staggered terms of office so that one class of the Board is elected annually, and each class of directors stands for election every three years.

The term of the Class III directors, Karin Eastham, V. Bryan Lawlis, Ph.D., and Susan M. Molineaux, Ph.D., will expire at the Annual Meeting. On February 22, 2023, Karin Eastham, a Class III director, notified the Company of her retirement from the Company's Board after 13 years of service and will depart from the Board upon the expiration of the current term of the Class III directors. In connection therewith, the Board has resolved to decrease its size to seven members effective upon the expiration of the current term of the Class III directors. As a result, there are two nominees for election as Class III directors at the Annual Meeting, Drs. Lawlis and Molineaux, both of whom were previously elected to the Board by the stockholders.

Proxies may only be voted for the two Class III directors nominated for election at the Annual Meeting. The Class I directors, John F. McDonald, John A. Scarlett, M.D. and Robert J. Spiegel, M.D., FACP have one year remaining on their terms of office. The Class II directors, Dawn C. Bir and Elizabeth G. O'Farrell, have two years remaining on their terms of office.

The following table provides summary information about each director nominee and directors who are serving terms that will continue following the Annual Meeting:

			Committee Memberships			
Name and Principal Position	**Age**	**Independent**	**AC**	**CC**	**NG**	**Other Public Boards**
2023 Director Nominees						
V. Bryan Lawlis, Ph.D. Independent Director	71	Yes	M	M	M	2
Susan M. Molineaux, Ph.D. Independent Director	69	Yes			C	1
Continuing Directors						
Dawn C. Bir Chief Commercial Officer, Reata Pharmaceuticals, Inc.; Independent Director	52	Yes			M	None
Elizabeth G. O'Farrell Independent Director	58	Yes	C, FE			2
John F. McDonald Independent Director	62	Yes	M			None
John A. Scarlett, M.D. Chairman of the Board, President and Chief Executive Officer	72	No				None
Robert J. Spiegel, M.D., FACP Independent Director	73	Yes		C		3

AC: Audit Committee
CC: Compensation Committee
NG: Nominating and Corporate Governance Committee

C: Chair
M: Member
FE: Financial Expert

NOMINEES FOR ELECTION TO THE BOARD OF DIRECTORS
For a Three-Year Term Expiring at the 2026 Annual Meeting

The Board has selected two nominees for Class III directors: V. Bryan Lawlis, Ph.D. and Susan M. Molineaux Ph.D., both of whom were previously elected by stockholders.

Set forth below is a brief biography of each nominee for Class III director, the periods during which they have served as a director of Geron, and information furnished by them as to principal occupations and public company directorships held by them. The biographies below also include a discussion of the specific experience, qualifications, attributes or skills of each nominee that led the Nominating and Corporate Governance Committee and the Board to conclude, as of the date of this Proxy Statement, that each nominee for Class III director should continue to serve as a director. Each person nominated for election has consented to being named as a nominee in this Proxy Statement and has agreed to serve if elected, and the Board has no reason to believe that any nominee will be unable to serve.

It is a key objective of the Company to have a diverse Board, representing a range of expertise, skills, perspectives and experiences in areas that are relevant to our business and the needs of the Board. As stated in our Nominating and Corporate Governance Committee Charter and our Corporate Governance Guidelines, as part of the director search process, the Nominating and Corporate Governance Committee endeavors to consider qualified candidates, who meet the relevant business and search criteria and actively seeks candidates with diversity of personal background, perspective, experience, gender, gender identity, race, ethnicity, sexual orientation, and age, as well as candidates from underrepresented communities. In furtherance of the foregoing, where a third-party search firm is engaged and requested to furnish an initial list of possible candidates, such firm will be requested to include in such list women and candidates from underrepresented communities who meet such criteria. Please also see the Board diversity discussion under “Board Leadership and Governance—Board Diversity” below.

Class III Director Nominees (Term Expiring at the 2026 Annual Meeting)

V. Bryan Lawlis, Ph.D.

Experience

Dr. Lawlis has served as a director of Geron since March 2012. He also serves as a member of the boards of directors of BioMarin Pharmaceutical, Inc., a biopharmaceutical company specializing in rare genetic diseases, since June 2007; Aeglea BioTherapeutics, Inc., a biotechnology company specializing in human enzyme therapeutics for rare genetic diseases, since July 2018; and several privately-held biotechnology companies. In addition, he serves as an advisor to Phoenix Venture Partners, a venture capital firm specializing in manufacturing technologies, since October 2015. Dr. Lawlis previously served as a director of Sutro Biopharma, Inc., a biologics platform company specializing in therapeutics for cancer and autoimmune disorders, from January 2004 to June 2019; and Coherus BioSciences, Inc., a biologic platform company specializing in biosimilars, from May 2014 to May 2021. Dr. Lawlis was the President and Chief Executive Officer of Itero Biopharmaceuticals LLC, a privately-held, early stage biopharmaceutical company that he co-founded, from 2006 to 2011. Dr. Lawlis also held several senior management positions in the biopharmaceutical industry, including President and Chief Executive Officer of Aradigm Corporation, a specialty drug company focused on drug delivery technologies, and President and Chief Executive Officer of Covance Biotechnology Services, a contract biopharmaceutical manufacturing operation, which he co-founded. Dr. Lawlis holds a B.A. in microbiology from the University of Texas at Austin and a Ph.D. in biochemistry from Washington State University.

Qualifications

The Board believes Dr. Lawlis’ extensive experience in manufacturing biotechnology and other pharmaceutical products, as well as his expertise in the research and development of drug products and in the management and conduct of clinical trials and drug regulatory processes, qualifies Dr. Lawlis to be elected as a director.

Susan M. Molineaux, Ph.D.

Experience

Dr. Molineaux has served as a director of Geron since September 2012. Dr. Molineaux has been Chief Executive Officer, President and a member of the board of directors of Calithera Biosciences, Inc., a biotechnology company developing oncology therapeutics, since co-founding the company in June 2010. Effective March 3, 2023, Nasdaq has delisted the common stock for Calithera, and effective March 14, 2023, the SEC has terminated registration of the common stock for Calithera. As a result, Calithera is no longer a public company. She has been a member of the board of directors of Cyteir Therapeutics, Inc., a clinical-stage DNA repair and synthetic lethality company, since December 2020. She also served as a director of Theravance Biopharma, Inc., a biopharmaceutical company, from April 2015 to April 2022, and has been a Scientific Advisor to Lightstone Ventures, a private life sciences investment company, since September 2016. Prior to Calithera, Dr. Molineaux co-founded Proteolix, Inc., a privately-held oncology-oriented biopharmaceutical company, where she served as Chief Scientific Officer from December 2003 until December 2005 and from February 2009 until November 2009, and as President and Chief Executive Officer from January 2006 until February 2009, until the company's acquisition by Onyx Pharmaceuticals, Inc., a global oncology-oriented biopharmaceutical company, in November 2009. Previously, Dr. Molineaux held several senior management positions in the biopharmaceutical industry, including Vice President of Biology at Rigel Pharmaceuticals, Inc., a biopharmaceutical company focused on inflammatory and autoimmune diseases; Vice President of Biology at Praelux, Inc., a biopharmaceutical company; and Vice President of Drug Development at Praecis Pharmaceuticals, Inc., an oncology-focused biopharmaceutical company. Dr. Molineaux holds a B.S. in biology from Smith College, a Ph.D. in molecular biology from Johns Hopkins University, and completed a postdoctoral fellowship at Columbia University.

Qualifications

The Board believes Dr. Molineaux's extensive experience in pharmaceutical and oncology drug development, her expertise in managing and conducting clinical trials, as well as her knowledge of the biotechnology industry and business, and healthcare related issues, combined with her experience as a female executive officer of a public company provides great value to the Board and contributes significantly to discussions and decision-making, which qualifies her to be elected as a director.

The Board of Directors Unanimously Recommends That Stockholders Vote FOR the Election of Both Nominees to the Board of Directors

MEMBERS OF THE BOARD OF DIRECTORS CONTINUING IN OFFICE AFTER THE ANNUAL MEETING

Set forth below is a brief biography of each continuing director composing the remainder of the Board with terms expiring as shown, including the periods during which they have served as a director of Geron, and information furnished by them as to principal occupations and public company directorships held by them. The biographies below also include a discussion of the specific experience, qualifications, attributes or skills of each continuing director that led the Nominating and Corporate Governance Committee and the Board to conclude, as of the date of this Proxy Statement, that the applicable director should continue to serve as a director.

Class I Directors (Term Expiring at the 2024 Annual Meeting)

John F. McDonald

Experience

John F. McDonald has served as a director of Geron since September 2022. Since October 2018, Mr. McDonald has served as Corporate Vice President, Head of Business Development and M&A, for Novo Nordisk A/S, a global pharmaceutical company, where he leads R&D business development activities, investment strategies and participates in the creation of research, early development, and therapeutic pipeline diversification and augmentation strategies. From 2011 to 2018, Mr. McDonald was Vice President, Business Development, at Biogen Inc., a biopharmaceutical company, where he led business development and negotiated numerous strategic alliances, licenses and acquisitions. From 2006 to 2011, Mr. McDonald served as Managing Director at MPM Capital LP, an investment firm, where he served as the primary business development and asset strategy resource for multiple portfolio companies. Prior to 2006, Mr. McDonald held business development, corporate strategy, and legal roles of increasing responsibility at various biopharmaceutical companies, including at Millennium Pharmaceuticals Inc., a biotechnology company, (now a Takeda Oncology Company, a pharmaceutical company), Genzyme Corp, a biopharmaceutical company, (now part of Sanofi, a pharmaceutical company) and Genentech, Inc., a biopharmaceutical company, (now a member of the Roche Group, a pharmaceutical company). In those roles, Mr. McDonald developed relationships with numerous academic institutions, as well as biotechnology and pharmaceutical companies of all stages. Mr. McDonald holds a J.D. from University of California Hastings College of the Law and an M.B.A. and B.S. from the Haas School of Business, University of California, Berkeley.

Qualifications

The Board believes Mr. McDonald's extensive experience in business development related to early stage pharmaceutical products, as well as his deep understanding of creating strategic relationships in the pharmaceutical industry, qualifies Mr. McDonald to serve as a director.

John A. Scarlett, M.D.

Experience

Dr. Scarlett has served as our Chief Executive Officer and a director since September 2011 and President since January 2012 and was appointed to Chairman of the Board in December 2018. Dr. Scarlett served as a director of CytomX Therapeutics, Inc., a biopharmaceutical company focused on developing antibody therapeutics for the treatment of cancer, from June 2016 to June 2022. He was also a director for Chiasma, Inc., a biopharmaceutical company focused on transforming injectable drugs into oral medications, from February 2015 until its acquisition by Amyrt Pharma plc, a biopharmaceutical company, in August 2021. Prior to joining Geron, Dr. Scarlett served as President, Chief Executive Officer and a member of the board of directors of Proteolix, Inc., a privately held, oncology oriented biopharmaceutical company, from February 2009 until its acquisition by Onyx Pharmaceuticals, Inc., an oncology oriented biopharmaceutical company, in November 2009. From February 2002 until its acquisition by Ipsen, S.A. in October 2008, Dr. Scarlett served as the Chief Executive Officer and a member of the board of directors of Tercica, Inc., an endocrinology oriented biopharmaceutical company, and also as its President from February 2002 through February 2007. From March 1993 to May 2001, Dr. Scarlett served as President and Chief Executive Officer of Sensus Drug Development Corporation. In 1995, he co-founded Covance Biotechnology Services, Inc., a contract biopharmaceutical manufacturing operation, and served as a member of its board of directors from inception to 2000. From 1991 to 1993, Dr. Scarlett headed the North American Clinical Development Center and served as Senior Vice President of Medical and Scientific Affairs at Novo Nordisk Pharmaceuticals, Inc., a wholly owned subsidiary of Novo Nordisk A/S. Dr. Scarlett received his B.A. degree in chemistry from Earlham College and his M.D. from the University of Chicago, Pritzker School of Medicine.

Qualifications

As the only management representative on the Board, Dr. Scarlett brings management's perspective to the Board's discussions about Geron's business and strategic direction. In addition, the Board believes Dr. Scarlett's deep understanding of what makes businesses work effectively and efficiently, as well as his medical background and extensive drug development experience, provide valuable insights to the Board. See discussion below regarding Board Leadership and Governance in connection with the appointment of a Lead Independent Director who provides leadership for the independent members of the Board.

Robert J. Spiegel, M.D., FACP

Experience

Dr. Spiegel has served as a director of Geron since May 2010. Dr. Spiegel currently serves as an Associate Professor at the Weill Cornell Medical School, a Senior Advisor to Warburg Pincus, a private equity firm, and an Advisor to the Israel Biotech Fund, a venture investment fund; and since September 2021, as Chief Medical Officer for Insilico Medicine, a privately-held artificial intelligence-driven pharma-technology company. He is also a member of the boards of directors of Cyclacel Pharmaceuticals, Inc., a biopharmaceutical company developing targeted medicines for cancer and other proliferative diseases, since September 2018; Ayala Pharmaceuticals, a clinical-stage oncology company, since December 2017; Athenex, Inc., a global biopharmaceutical oncology company, since August 2020; and several privately-held biotechnology companies. He previously served as a director for Avior Computing Corporation, a privately-held governance risk and compliance process technology company, from October 2011 to November 2017; Talon Therapeutics, Inc., a biopharmaceutical company, from July 2010 to July 2013; Capstone Therapeutics Corp., a biotechnology company, from May 2010 to January 2012; Sucampo Pharmaceuticals, Inc., a biopharmaceutical company, from January 2015 to January 2018; and PDS Biotechnology Corporation (formerly Edge Therapeutics, Inc.), a biotechnology company, from August 2013 to March 2019; the Cancer Institute of New Jersey from 1999 to 2009; and Cancer Care New Jersey from 1995 to 2011. From March 2011 to April 2016, Dr. Spiegel served as Chief Medical Officer of PTC Therapeutics, Inc., a biopharmaceutical company focused on discovering and developing treatments for rare disorders. In 2009, after 26 years with the Schering-Plough Corporation (now Merck & Co.), a global healthcare company, Dr. Spiegel retired as Chief Medical Officer and Senior Vice President of the Schering-Plough Research Institute, the pharmaceutical research arm of the Schering-Plough Corporation. His career at Schering-Plough involved various positions, including Director of clinical research for oncology, Vice President of clinical research, and Senior Vice President of worldwide clinical research. Following a residency in internal medicine, Dr. Spiegel completed a fellowship in medical oncology at the National Cancer Institute, and from 1981 to 1999 he held academic positions at the National Cancer Institute and New York University Cancer Center. Dr. Spiegel holds a B.A. from Yale University and an M.D. from the University of Pennsylvania.

Qualifications

The Board believes Dr. Spiegel's extensive medical experience developing oncology products, his deep understanding of pharmaceutical research and development, and broad expertise in gaining regulatory approval for drug candidates, enhances the Board's ability to critically assess the progress and potential of imetelstat, and qualifies Dr. Spiegel to serve as a director.

Class II Directors (Term Expiring at the 2025 Annual Meeting)

Dawn C. Bir

Experience

Ms. Bir has served as a director of Geron since March 2019. Since September 2016, Ms. Bir has served as the Chief Commercial Officer of Reata Pharmaceuticals, Inc., a biopharmaceutical company, where she leads marketing, market access, sales, and commercial operations. From February 2013 to September 2016, Ms. Bir served as Vice President of Sales with Pharmacyclics LLC, an AbbVie company, a global pharmaceutical company, where she built and led their first hematology national sales organization, and was responsible for the launch of IMBRUVICA in the United States and Puerto Rico. From October 2011 to February 2013, Ms. Bir served as Vice President of Sales & Marketing of SKY Pharmaceuticals Packaging, Inc. & Rx Pak, a unit within the U.S. pharmaceutical and specialty solutions division of McKesson Corporation, a global healthcare company, where she was responsible for two companies and revenue centers, and led multiple functions, including sales, marketing, contract management, project management and customer service. From 1996 to October 2011, Ms. Bir held several commercial and sales positions of increasing responsibility within

Genentech, Inc., a member of the Roche Group, a global pharmaceutical company, and Bristol-Myers Squibb Company, a global pharmaceutical company. Ms. Bir holds a B.S. in Biology from Binghamton University.

Qualifications

The Board believes Ms. Bir's extensive commercial, sales and marketing expertise, including with hematology-oncology products, broadens the Board's ability to advise, evaluate and analyze future potential commercialization activities for imetelstat, especially in the United States, as well as to provide insights into the competitive landscape of other hematology-oncology products. This knowledge and experience, together with her strong leadership ability as a female executive in the healthcare industry, qualify Ms. Bir to serve as a director.

Elizabeth G. O'Farrell

Experience

Ms. O'Farrell has served as a director of Geron since March 2019. Ms. O'Farrell also serves as a member of the boards of directors of LENSAR, Inc., a global medical technology company, since February 2021, where Ms. O'Farrell serves as the chair of the Audit Committee, and Genmab A/S, a global oncology company, since March 2022, where she serves on the Audit Committee and Compensation Committee. Since June 2018, Ms. O'Farrell has also served as a director of PDL BioPharma, Inc., a non-public company focused on acquiring and managing a portfolio of companies, products, royalty agreements and debt facilities in the healthcare industry, which commenced its dissolution in January 2021. Ms. O'Farrell served as a director of Inhibikase Therapeutics, a pharmaceutical company focused on treatments of neurological infections and neurodegenerative diseases, from March 2019 to September 2022. From 2018 to 2020, Ms. O'Farrell served on the finance committee of the United Way of Brevard (Brevard County, Florida), a non-profit organization, and is a volunteer mentor with WeVenture, a small business mentoring program affiliated with the Florida Institute of Technology. Ms. O'Farrell also served as a board member of the YMCA of Greater Indianapolis from 2006 until 2017, including as its chairperson from 2014 to 2016. In December 2017, Ms. O'Farrell retired from a 24-year career with Eli Lilly and Company, a global pharmaceutical company, where she held several senior management positions in finance and corporate governance, most recently serving as Chief Procurement Officer and Head of Global Shared Services from January 2012 to December 2017. Prior to that position, she also served as Senior Vice President, Policy and Finance; Senior Vice President, Finance; Chief Financial Officer, Lilly USA; Chief Financial Officer, Lilly Canada; and General Auditor. Before joining Eli Lilly, Ms. O'Farrell was an accountant with Boise Cascade Office Products, and served as an auditor at Whipple & Company, a professional accountancy firm, and Price Waterhouse, an international public accounting firm. Ms. O'Farrell holds a B.S. in accounting with honors and an M.B.A. in management information systems, both from Indiana University.

Qualifications

Ms. O'Farrell's significant financial, operational and corporate governance expertise strengthens the Board's collective knowledge related to compliance, financial reporting and internal controls. In addition, Ms. O'Farrell's management and leadership experience, gained through the various management roles she has held, also provides unique and valuable insights to the Board regarding organizational development for a growing company, as Geron pursues late-stage development and potential commercialization of imetelstat. The Board believes Ms. O'Farrell's knowledge and experience as a senior female executive with a long tenure at a large global pharmaceutical company qualify Ms. O'Farrell to serve as a director.

BOARD LEADERSHIP AND GOVERNANCE

We have an ongoing commitment to excellence in corporate governance and business practices. In furtherance of this commitment, we regularly monitor developments in the area of corporate governance and review our processes, policies and procedures in light of such developments. Key information regarding our corporate governance initiatives can be found on the Corporate Governance page under the Investors & Media section of our website at https://ir.geron.com/investors/corporate-governance/, including our Corporate Governance Guidelines, Code of Conduct, Insider Trading Policy and the charters for our Audit, Compensation, and Nominating and Corporate Governance committees. We believe that our corporate governance policies and practices, including the substantial percentage of independent directors on our Board and the leadership provided by our Lead Independent Director, Ms. Eastham until the expiration of her term at the Annual Meeting, empower our independent directors to effectively oversee our management – including the

performance of our Chief Executive Officer – and provide an effective and appropriately balanced board governance structure. A new Lead Independent Director will be appointed on or about the Annual Meeting.

Corporate Governance Guidelines

Our Board has adopted Corporate Governance Guidelines that set forth key principles to guide the operation of the Board and its committees in the exercise of their responsibilities to serve the interests of Geron and our stockholders. As stated in our Nominating and Corporate Governance Committee Charter and our Corporate Governance Guidelines, as part of the director search process, the Nominating and Corporate Governance Committee endeavors to consider qualified candidates, including candidates who self-identify their gender as female and candidates from underrepresented communities, who meet the relevant business and search criteria. In furtherance of the foregoing, where a third-party search firm is engaged and requested to furnish an initial list of possible candidates, such firm will be requested to include in such list candidates who self-identify their gender as female and candidates from underrepresented communities who meet such criteria.

The current form of the Corporate Governance Guidelines can be found on our website at https://ir.geron.com/investors/corporate-governance/. In addition, these guidelines are available in print to any stockholder who requests a copy. Please direct all requests to our Corporate Secretary, Geron Corporation, 919 E. Hillsdale Blvd., Suite 250, Foster City, California 94404.

Board Independence

In accordance with Nasdaq listing standards and Geron's Corporate Governance Guidelines, a majority of the members of our Board must qualify as "independent" as defined by Nasdaq Rule 5605(a)(2). In keeping with these guidelines, a member of our Board may serve as a director of another company only to the extent such position does not conflict or interfere with such person's service as a director of Geron. The Board consults with our legal counsel to ensure that the Board's determinations regarding Board independence 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, our Board has determined affirmatively that each of Dr. Lawlis, Dr. Molineaux, Ms. Bir, Ms. O'Farrell, Mr. McDonald and Dr. Spiegel are independent within the meaning of the Nasdaq listing standards. Dr. Scarlett, who is our Chairman of the Board, President and Chief Executive Officer, is the sole non-independent director, and the Board regularly meets in executive sessions outside the presence of Dr. Scarlett.

There are no family relationships between any director and any member of our executive management team. There are no arrangements or agreements relating to compensation provided by a third party to any member of our Board, including current nominees for director, in connection with their candidacy or Board service to us.

Board Leadership Structure

In December 2018, Dr. Scarlett was appointed by the Board to serve as Chairman of the Board, in addition to his role as President and Chief Executive Officer of the Company. In light of positive top-line results from the IMerge Phase 3 clinical trial in Low or Intermediate-1 risk myelodysplastic syndromes, or lower risk MDS, and the preparations for regulatory submissions and potential commercialization of imetelstat, the Board continues to believe that Dr. Scarlett is best suited to serve as our Chairman because he is the member of the Board who is most familiar with our business as a whole and the most capable of identifying and bringing to the attention of the full Board the strategic priorities and key issues facing the Company. The Board also believes that having Dr. Scarlett in a combined Chairman/Chief Executive Officer role helps provide strong, unified leadership for our executive management team. To counterbalance our Board's decision to have a combined Chairman and Chief Executive Officer, the Company's Corporate Governance Guidelines require that the Board appoint a Lead Independent Director when the role of Chairman is held by a director who does not qualify as an independent director. In December 2018, the Board appointed Ms. Eastham to serve as Lead Independent Director for the Board and Ms. Eastham will serve as our Lead Independent Director until the expiration of her Board term as a Class III director at the Annual Meeting. The Board will appoint a new Lead Independent Director on or around the Annual Meeting. The Lead Independent Director facilitates Board interactions and information flow, and the structure also allows for a clear communication path for the non-employee directors, who may raise any issues or concerns that they have directly with the Lead Independent Director.

The Chairman of the Board has the authority, among other things, to call and preside over Board meetings, to set meeting agendas and to determine materials to be distributed to the Board. However, the Lead Independent Director provides active leadership on behalf of the independent directors on the Board. The Lead Independent Director with the Chairman of the Board advises on Board meeting agendas and discussion priorities. In addition, the Lead Independent Director provides regular communications to directors between meetings, inviting comments, ideas and concerns from each non-employee director. The Lead Independent Director also has the following responsibilities:

- Presiding at executive sessions of non-employee directors;
- Serving as a liaison between the Board Chairman and non-employee directors;
- Advising the Board Chairman regarding the impression of the non-employee directors as to the quality, quantity and timeliness of the flow of information from the Company that is necessary for the Board to effectively perform its duties; and
- Accepting additional responsibilities as may be recommended from time-to-time by the Board or the non-employee directors of the Board.

Board Diversity

Since Mr. McDonald's appointment to the Board in September 2022, our Board has been comprised of four women and four men. Accordingly, as a Nasdaq Smaller Reporting Company, we are in compliance with Nasdaq Rules 5605 and 5606, which require us to have two female board members. In addition, the Chairs of the Audit Committee and Nominating and Corporate Governance Committee are women.

As stated in our Nominating and Corporate Governance Committee Charter and our Corporate Governance Guidelines, as part of the director search process, the Nominating and Corporate Governance Committee endeavors to consider qualified candidates who meet the relevant business and search criteria and actively seeks candidates with diversity of personal background, perspective, experience, gender, gender identity, race, ethnicity, sexual orientation, and age, as well as candidates from underrepresented communities.

Board Committees and Meetings

It is our policy to encourage directors to attend annual meetings of stockholders. All of our directors, except Mr. McDonald who joined our Board in September 2022, attended our 2022 annual meeting of stockholders, which was conducted in a virtual meeting format. During the year ended December 31, 2022, the Board held nine meetings. Of these, six meetings were conducted by videoconference due to the COVID-19 pandemic and three meetings were conducted in-person. The Board has an Audit Committee, a Compensation Committee, and a Nominating and Corporate Governance Committee. During the year ended December 31, 2022, each of the current directors attended at least 75% of the aggregate number of meetings of the Board and the committees on which the director served during the portion of the last fiscal year for which they were a director or committee member.

Below is a description of each committee of the Board. Each of the committees has authority to engage and determine the compensation for legal counsel or other experts or consultants, as it deems appropriate, to assist with fulfilling its responsibilities. The Board has determined that each member of each committee meets the applicable Nasdaq and SEC rules and regulations regarding "independence" and that each member is free of any relationship that would impair his or her individual exercise of independent judgement with regard to Geron.

Audit Committee

The Audit Committee operates under a written charter that satisfies the applicable standards of the SEC and Nasdaq. A copy of the Audit Committee charter is available on our website at https://ir.geron.com/investors/corporate-governance/. The Audit Committee held seven meetings for the year ended December 31, 2022, of which six were conducted by videoconference due to the COVID-19 pandemic and one was conducted in-person. The Audit Committee's responsibilities include:

- appointing or terminating, approving the compensation of, and assessing the qualifications, performance and independence of our independent registered public accounting firm;

- pre-approving audit and permissible non-audit services and the terms of such services to be provided by our independent registered public accounting firm;
- reviewing the plan and scope of the annual audit of consolidated financial statements with the independent registered public accounting firm and members of management;
- reviewing and discussing with management and/or the independent registered public accounting firm, prior to public disclosure, our annual and quarterly consolidated financial statements and related disclosures in our Forms 10-K, Forms 10-Q, and earnings press releases, including critical accounting policies and practices used by us and information contained in "Management's Discussion and Analysis of Financial Condition and Results of Operations";
- recommending to the Board, based upon the Audit Committee's review and discussions with management and the independent registered public accounting firm, whether our audited consolidated financial statements shall be included in our Annual Report on Form 10-K;
- monitoring our internal control over financial reporting and disclosure controls and procedures and any significant changes in our internal controls, including reviewing management's assessment and disclosures related to any significant changes, material weaknesses or significant deficiencies;
- overseeing compliance with legal and regulatory requirements as they relate to our consolidated financial statements and accounting matters, including our insider trading compliance program;
- establishing policies and procedures for the receipt and retention of whistleblower complaints and concerns and overall compliance with our Code of Conduct;
- preparing the audit committee report required by the SEC to be included in our annual proxy statement;
- reviewing and approving or ratifying any related party transactions;
- overseeing financial and operational risk exposures and the actions management has taken to limit, monitor and control such exposures; and
- reviewing risks relating to data privacy, technology and information security, including cyber-security, and back-up of information systems.

For the year ended December 31, 2022, the Audit Committee members were Ms. Eastham, Ms. O'Farrell and Dr. Lawlis, and commencing on November 8, 2022, Mr. McDonald. The Board has determined that all of the members of the Audit Committee are financially literate and that two members of the Audit Committee, Ms. Eastham and Ms. O'Farrell, have accounting and financial management expertise that qualifies each as an "Audit Committee Financial Expert," as such term is defined in Item 407(d)(5) of Regulation S-K promulgated by the SEC. Effective February 16, 2022, the role of chairperson of the Audit Committee transferred from Ms. Eastham to Ms. O'Farrell. See more information about the Audit Committee in the section entitled "Audit Committee Report."

Compensation Committee

The Compensation Committee operates under a written charter that satisfies the applicable standards of the SEC and Nasdaq. A copy of the Compensation Committee charter is available on our website at https://ir.geron.com/investors/corporate-governance/. The charter of the Compensation Committee allows it to delegate responsibilities to a subcommittee of the Compensation Committee, but only to the extent consistent with our certificate of incorporation, Bylaws and Nasdaq rules. The Compensation Committee held three meetings for the year ended December 31, 2022, two of which were conducted by videoconference due to the COVID-19 pandemic, and one of which was conducted in-person. The Compensation Committee's responsibilities include:

- establishing and overseeing our executive compensation philosophy and strategy;
- reviewing and approving the terms of any employment agreements, severance arrangements, change in control protections and other compensatory arrangements for our executive management team, including our Chief Executive Officer;
- annually reviewing and recommending to the Board corporate goals and objectives relevant to the compensation of our executive management team, including our Chief Executive Officer;

- reviewing and approving, or making recommendations to the Board with respect to, the compensation of our executive management team, including our Chief Executive Officer, based upon an annual evaluation of each individual's performance;
- overseeing and administering our cash and equity incentive plans, including establishing policies and procedures for the grant of equity-based awards and approving, or making recommendation to the full Board with respect to, the grant of such equity-based awards;
- appointing, compensating and overseeing the work of any compensation and benefits consultants, legal counsel or other experts or advisors retained by the Compensation Committee, including an independence assessment as outlined by Nasdaq rules;
- when and as required by applicable rules and regulations, reviewing and discussing with management our compensation discussion and analysis disclosure to be included in our annual proxy statement;
- reviewing and making recommendations to our Board regarding non-employee director compensation and benefits;
- reviewing and assessing the potential impact of our compensation practices on enterprise risk; and
- reviewing our strategies, initiatives and programs with respect to our culture, talent recruitment, development, and retention, employee engagement, and diversity and inclusion.

For information on the Compensation Committee's processes and procedures on the consideration and determination of executive compensation, see the section entitled "Executive Compensation." For information on the Compensation Committee's processes and procedures with respect to non-employee director compensation matters, see the section entitled "Compensation of Directors."

Nominating and Corporate Governance Committee

The Nominating and Corporate Governance Committee operates under a written charter that satisfies the applicable standards of the SEC and Nasdaq. A copy of the Nominating and Corporate Governance Committee charter is available on our website at https://ir.geron.com/investors/corporate-governance/. The Nominating and Corporate Governance Committee held three meetings for the year ended December 31, 2022, two of which were conducted by videoconference due to the COVID-19 pandemic, and one of which was conducted in-person. The Nominating and Corporate Governance Committee's responsibilities include:

- developing, reviewing and recommending to the Board a set of corporate governance guidelines and principles;
- creating and recommending to the Board criteria for Board and committee membership;
- establishing procedures for identifying and evaluating individuals qualified to become members of the Board, including candidates who self-identify their gender as female and candidates from underrepresented communities and nominees recommended by stockholders;
- recommending to the Board the persons to be nominated for election or re-election as directors;
- recommending to the Board whether to accept or reject a director resignation, or take other action, where a director fails to receive a majority vote as specified under our corporate governance guidelines;
- reviewing and recommending to the Board the functions, duties and compositions of the Board committees;
- considering and reporting to the Board any questions of possible conflicts of interest of Board members; and
- assessing the performance of the Board, the Board committees and individual directors.

Specific qualifications and the process for recommending director candidates are provided in more detail under the sub-sections entitled "Other Matters – Director Nominees Recommended by Stockholders" and "Other Matters – Director Qualifications."

Drs. Molineaux and Lawlis, and Ms. Bir served on the Nominating and Corporate Governance Committee for the year ended December 31, 2022.

Board's Role in Risk Oversight

Geron is subject to a variety of risks, including those described under the section entitled "Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2022. Some risks may be readily perceived and even quantified, while others are unexpected or unforeseeable. Risks can be external or can arise as a result of our internal business or financial activities. Our Board, as a whole, is responsible for broad oversight of all existing and emerging enterprise risk (over the short-, mid- and long-term) and of management's development and execution of mitigation strategies designed to address those risks. In this capacity, our Board has designated committees to assist in its oversight of particular key risks as described below. Oversight of additional matters of potential risk not delegated remain the responsibility of the full Board.

While the Board and its committees oversee risk management, the Company's senior management is responsible for identifying, assessing and mitigating risk on a day-to-day basis. Each committee of our Board meets regularly with key management personnel and, as desired by the applicable committee, outside advisors (including outside counsel, consultants and experts) to oversee risks associated with their respective principal areas of focus. In turn, each committee reports to the Board regularly, fostering awareness and communication of significant matters among all directors, and promoting a coordinated and cohesive approach to enterprise risk oversight. It is management's responsibility to identify various risks facing the Company, bring the Board's attention to material risks, and implement appropriate risk management policies and procedures to manage risk exposure on a day-to-day basis.

Specific risks being overseen by Board committees are as follows:

- The Audit Committee oversees management of financial risks. In addition to fulfilling its responsibilities for the oversight of our financial reporting processes and annual audit of Geron's consolidated financial statements, the Audit Committee also reviews with the Company's independent registered public accounting firm and the Company's management the adequacy and effectiveness of our policies and procedures to assess, monitor and manage fraud risk and our ethical compliance program. The Audit Committee takes appropriate actions to set the best practices and highest standards for quality financial reporting, sound business risk practices, including practices related to cyber-security, and ethical behavior.
- The Compensation Committee is responsible for overseeing the management of risks relating to our employment policies and executive compensation plans and arrangements. In connection with structuring the executive compensation program, the Compensation Committee, together with the Board, considers whether the elements of such program, individually or in the aggregate, encourage our executive management team to take unnecessary risks. For further information, see the sub-section entitled "Risk Assessment of Compensation Policies and Practices."
- The Nominating and Corporate Governance Committee manages Geron's corporate governance practices. The Nominating and Corporate Governance Committee also reviews risks associated with the independence of the Board, potential conflicts of interest and risks relating to management and Board succession planning. In addition, the Board delegated to the Nominating and Corporate Governance Committee the responsibility for overseeing the management of risks associated with the COVID-19 pandemic.

Risk Assessment of Compensation Policies and Practices

The Compensation Committee maintains a pay for performance compensation philosophy, but also recognizes that providing certain types of compensation incentives may inadvertently motivate individuals to act in ways that could be detrimental to the Company in order to maximize individual compensation. To minimize such risk, the Compensation Committee annually evaluates our compensation philosophy generally as it relates to all employees, as well as individual compensation elements of base salary, annual performance-based bonuses, equity awards, severance and change in control benefits and other benefits to ensure each is evaluated against appropriate standards and that such incentives provide for the achievement of target goals that are balanced between short-term rewards and long-term enhancement of stockholder value.

The Compensation Committee believes the following elements of our executive compensation program mitigate the risks associated with our compensation practices:

- setting annual base salaries consistent with the responsibilities of our executive management team and market comparables to ensure that our executive management team is not motivated to take excessive risks to achieve a reasonable level of financial security;
- establishing corporate goals for our annual performance-based bonus program that are consistent with our annual operating and strategic plans and are designed to achieve a proper risk/reward balance without excessive risk taking;
- requiring any member of the executive management team to forfeit his or her entire annual performance-based bonus if we determine that such individual has engaged in any misconduct intended to affect the payment of his or her annual performance-based bonus, or has otherwise engaged in any act or omission that would constitute cause for termination of his or her employment, as defined by his or her employment agreement;
- having a mix of fixed and variable, annual and long-term and cash and equity compensation elements to encourage strategies and actions that balance short-term and long-term best interests;
- granting stock option awards which provide value only if the market price of our Common Stock increases to encourage our executive management team to take a long-term view of our business and performance-based stock option awards that only vest upon the attainment of specific strategic milestones;
- absence of employment agreements or contracts that contain multi-year guarantees of salary increases, or non-performance-based bonuses or equity compensation;
- emphasizing pay equity amongst our employees and with reference to external comparators; and
- having available, to the Compensation Committee and the Board, the discretion to measure and calculate achievement of corporate goals and other corporate performance measures, which prevents the compensation program from being susceptible to manipulation by a single employee.

The Compensation Committee has reviewed our compensation policies and practices as they relate to all employees and has determined that such policies and practices do not present any risks that are reasonably likely to have a material adverse effect on Geron, and instead, encourage behaviors that support sustainable value generation. In addition, the Compensation Committee has reviewed and evaluated our executive compensation program and believes that our executive compensation policies and practices do not encourage inappropriate actions or risk taking by our executive management team.

OTHER CORPORATE GOVERNANCE MATTERS

ESG Highlights

We believe that environmental sustainability, social responsibility and good corporate governance ("ESG") are important to our business. Our ESG efforts are shaped by our values and aim to make a positive impact in the world through our people and imetelstat, our sole product candidate. As we move forward, we will continue to focus on our impact beyond product development and potential commercialization, to support our communities and meet our responsibilities to society as a whole.

Commitment to Purpose. The foundation of our business efforts is to provide improved treatment for patients with hematologic malignancies. Currently, we are working tirelessly to develop a safe and effective cancer treatment for patients with lower risk MDS and Intermediate-2 or High-Risk myelofibrosis who have relapsed after or are refractory to treatment with a janus associate kinase inhibitor, or JAK inhibitor, or relapsed/refractory MF. As part of our commitment to this important goal in 2022, we became a National Level sponsor of the MDS Foundation "Walk for MDS" events held in five cities as live walks and one virtual global walk. Several of our employees participated in person in New York City, and our medical affairs team participated at the event in Chicago. Others joined the virtual event, walking locally to raise money and awareness. Our goal to improve the lives of cancer patients is the reason why we do what we do, and we are committed to transforming patients' lives through our activities.

Environmental Sustainability. We endeavor to conduct our business in an environmentally sound manner. Although we do not operate any manufacturing facilities, our San Francisco Bay Area headquarters are located in a multi-tenant building that is energy efficient, and our office suites are environmentally friendly in their use of electricity, water and power. In response to the COVID-19 pandemic, we made travel to our San Francisco Bay Area and northern New Jersey offices voluntary, and provided equipment and access tools to ensure our employees could be productive, as well as a monthly stipend to cover expenses related to working from home. Our increased use of technology has enabled our employees to lessen the need to print and distribute paper documents, reducing the environmental impact of our business, and the results of our safety measures have resulted in far fewer employees driving to the office, thus taking cars off the road and reducing greenhouse gases. We have established a Commuter Benefit Program to encourage our employees to use public transit by enabling employees to use pre-tax dollars to pay for public transit costs.

Human Capital Management and Employee Engagement. We engage with our employees to enable them to reach their fullest potential as leaders in our community. To that end, we designed and implemented a Leadership Training and Development Program to enhance our employees' teamwork and leadership skills and are also investing in the professional development of our employees through a continued learning reimbursement program designed to encourage employees to pursue personal and professional development opportunities to enhance their professional skills. We encourage our employees to be active and engaged community citizens by allowing them one paid day off per year to volunteer for a non-profit organization or charity of their choice. In January 2022, we supported the health and welfare of our employees by offering a wellness reimbursement program to promote employee physical, emotional, and financial well-being through the reimbursement of eligible wellness expenses. In January 2023, we enhanced our commitment to supporting employee health and well-being by offering an expanded mental health benefit where employees can manage their mental and physical health through a wide range of covered services. In addition, we engage with our employees by surveying them on topics of interest, and transparently share the full results of surveys with employees and our executive management team. We aim to take action in areas that are identified in surveys as important to our employees.

Diversity, Inclusion and Corporate Culture. We value workplace diversity, including diversity of personal background, perspective, experience and other characteristics, such as gender, gender identity, ethnicity, sexual orientation, age, and underrepresented communities. As of December 31, 2022, we had 105 full-time employees and two part-time employees. Seventeen of our employees hold Ph.D. degrees and 41 hold other advanced degrees, and as of December 31, 2022, approximately 67% of our Company's managerial roles were held by women. Our corporate values are authenticity, accountability, excellence, integrity and respect, and we are committed to building a corporate culture that enforces these values. Since 2021, we have utilized a peer-centric employee recognition program to empower employees to champion our workplace culture and values, and promote direct praise to peers.

Corporate Governance Practices. We are committed to exercising good corporate governance and frequently review our practices. We believe that good corporate governance promotes the long-term interests of our stockholders and strengthens our Board and management accountability. Highlights of our corporate governance practices include the following:

- Stockholder Rights and Accountability
    - Our directors are elected using plurality voting, with a director resignation policy in the cases of contested elections.
- Board Independence
    - All current directors and nominees for director are independent, other than our Chairman and CEO, Dr. Scarlett.
    - Our Audit Committee meets regularly, including meeting with the independent registered public accounting firm serving as our independent auditors, outside the presence of our executive management team.
    - 100% of our Board committee members are independent.
    - Our Lead Independent Director has clearly delineated duties and authority.
    - Our Board and committees may engage outside advisors independently of management.

- Board Practices
    - Members of the Board and each Board committee annually perform anonymous self-evaluations which are reviewed by the Nominating and Corporate Governance Committee.
    - Our full Board and individual Board committees provide risk oversight.
    - Our Board annually approves annual corporate budget spend, as well as reviews and approves individual purchases over a specified dollar threshold.
- Insider Trading Compliance
    - Our insider trading policy prohibits short sales, transactions in put or call options, hedging transactions, or other inherently speculative transactions in our stock or engaging in margin activities.
- Robust Compensation-Setting Process
    - Independent compensation consultant reports directly to the Compensation Committee.
    - Employment agreements for each member of our executive management team, including our Named Executive Officers, contain clawback provisions.

Code of Conduct

In December 2022, we adopted an updated Code of Conduct to, among other things, reflect current industry and public company best practices and enhance and expand on guiding principles and policies, including expanding provisions related to (i) compliance with health care laws and regulations, (ii) product quality, pharmacovigilance and regulatory compliance, and (iii) privacy and information security policies. Our updated Code of Conduct is available in its entirety on the Corporate Governance page in the Investors & Media section of our website at www.geron.com and to any stockholder otherwise requesting a copy. All our directors, employees and members of our executive management team, including our Chief Executive Officer and Chief Financial Officer, are required to adhere to the Code of Conduct in discharging their work-related responsibilities. Employees are required to report any conduct they believe in good faith to be an actual or apparent violation of the Code of Conduct. Amendments to the Code of Conduct, and any waivers from the Code of Conduct granted to our directors or members of our executive management team, will be made available through our website as they are adopted. Accordingly, we intend to satisfy the disclosure requirement under Item 5.05 of Form 8-K regarding an amendment to, or waiver from, a provision of the Code of Conduct by posting such information on our website at www.geron.com.

Whistleblower Policy

In keeping with the Sarbanes-Oxley Act of 2002, the Audit Committee has established procedures for the receipt and handling of complaints received by us regarding accounting, internal accounting controls, auditing matters, questionable financial practices or violations of our Code of Conduct ("complaints"). Contact information for an external hotline that is maintained by an independent third party has been distributed to all employees and consultants to allow for the confidential, anonymous submission of complaints by our employees and consultants. Any complaints received by this hotline are reviewed by the Audit Committee and our Chief Legal Officer.

Prohibitions on Derivative, Hedging, Monetization and Other Transactions

We maintain an insider trading compliance program that applies to all directors and employees, including members of our executive management team, and certain consultants and contractors, which prohibits certain transactions in our Common Stock, including short sales, puts, calls or other transactions involving derivative securities on an exchange or in any other organized market, hedging or monetization transactions, purchases of our Common Stock on margin or borrowing against an account in which our Common Stock is held, or pledging our Common Stock as collateral for a loan. Our Audit Committee oversees compliance with our insider trading compliance program, including approval of any material updates to the insider trading compliance program. Our Chief Legal Officer serves as our insider trading compliance officer and reports, at least once annually, to the Audit Committee on his monitoring of the insider trading compliance program. In addition, the Audit Committee meets with the insider trading compliance officer outside of the presence of any other member of the executive management team. A copy of our insider trading compliance policy is available on our website at https://ir.geron.com/investors/corporate-governance/.

Communications with the Board

Stockholders wishing to communicate with the Board, or with a specific Board member, may do so by writing to the Board, or to the individual Board member, and delivering the communication in person or mailing it to: Board of Directors, c/o Stephen N. Rosenfield, Corporate Secretary, Geron Corporation, 919 E. Hillsdale Blvd., Suite 250, Foster City, California 94404. All mail addressed in this manner will be delivered to the Chair of the Board or Chairs of the Board committees with responsibilities touching most closely on the matters addressed in the communication. From time to time, the Board may change the process by which stockholders may communicate with the Board or its members. Please refer to our website for any changes to this process.

COMPENSATION OF DIRECTORS

The Compensation Committee determines non-employee director compensation, which the full Board reviews and approves upon recommendation from the Compensation Committee. When considering non-employee director compensation decisions, the Compensation Committee believes it is important to be informed as to current compensation practices of comparable publicly-held companies in the life sciences industry, especially to understand the demand and competitiveness for attracting and retaining an individual with each of the non-employee director's specific expertise and experience. Our compensation arrangements for non-employee directors are set forth in our Non-Employee Director Compensation Policy (the "Director Compensation Policy"). The Director Compensation Policy outlines cash and equity compensation automatically payable to non-employee directors of the Board unless such non-employee director declines receipt of such cash or equity compensation by written notice to us. Historically, the Compensation Committee has reviewed our non-employee director compensation relative to industry practices every other year.

In January 2022, the Compensation Committee requested Radford, which is part of the Rewards Solutions practice at Aon plc ("Radford"), to serve as the independent compensation consultant engaged by the Compensation Committee and conduct a review of non-employee director compensation in comparison to our 2021 peer group. Based on this review, and guidance from Radford, in the first quarter of 2022, the Board revised the equity compensation components of the Director Compensation Policy as described below. For further discussion of the defined peer group recommended by Radford, see the section entitled "Executive Compensation."

Cash Compensation

The following table describes the annual cash compensation applicable to each role performed by non-employee directors as outlined in the Director Compensation Policy in effect for the year ended December 31, 2022 ("2022 fiscal year"):

Non-Employee Director Role	Base Retainer	Additional Retainer
Board member	$ 42,500	N/A
Chairman of the Board	N/A	$ 35,000
Lead Independent Director	N/A	$ 25,000
Audit Committee Chair[(1)]	N/A	$ 25,000
Compensation Committee Chair[(1)]	N/A	$ 15,000
Nominating and Corporate Governance Committee Chair[(1)]	N/A	$ 10,000
Audit Committee member	N/A	$ 12,500
Compensation Committee member	N/A	$ 7,500
Nominating and Corporate Governance Committee member	N/A	$ 5,000

(1) Committee Chair does not also receive additional Committee member compensation.

Under the Director Compensation Policy, annual non-employee director cash compensation is paid quarterly in arrears in cash, or, at each director's election, in fully vested shares of our Common Stock. In 2022, such Common Stock was issued under the Directors' Market Value Stock Purchase Plan (the "Directors Market Value Plan"), which the Board adopted in October 2018, based on the "market value" on the purchase date (which generally means the consolidated closing bid price per share of our Common Stock as reported by Nasdaq on the purchase date).

Additionally, under the Director Compensation Policy, non-employee directors are eligible to receive equity grants, as more fully described below under the sub-section entitled "Equity Compensation." Non-employee directors also receive reimbursement for out-of-pocket expenses incurred in connection with attendance at meetings of the Board.

Director Compensation Table

The following table provides compensation information for the 2022 fiscal year, for each non-employee director of the Board who served in such capacity during the 2022 fiscal year. Dr. Scarlett does not receive any compensation for his Board service.

Non-Employee Director	Fees Earned or Paid in Cash ($) [1]	Option Awards ($) [2]	Total ($)
Bir, Dawn	47,500	125,200	172,700
Eastham, Karin	89,097	125,200	214,297
Lawlis, V. Bryan	67,500	125,200	192,700
McDonald, John [3]	15,197	375,880	391,077
Molineaux, Susan	52,500	125,200	177,700
O'Farrell, Elizabeth	65,903	125,200	191,103
Spiegel, Robert	57,498 [4]	125,200	182,698

(1) Consists of the annual retainer fee for service as a member of the Board of Directors or any Board committee. For further information concerning such fees, see the sub-section above entitled "Cash Compensation."

(2) Amounts do not reflect dollar amounts actually received by our non-employee directors and instead, in accordance with SEC rules, represent the aggregate grant date fair value of stock option awards granted to our non-employee directors during the 2022 fiscal year, as calculated in accordance with Financial Accounting Standards Board Accounting Standards Codification Topic 718 ("FASB ASC Topic 718"). Refer to Note 9 of the consolidated financial statements in our Annual Report on Form 10-K for the 2022 fiscal year regarding assumptions underlying the valuation of stock option awards and the calculation method. For information regarding the aggregate number of stock option awards held by the non-employee directors of the Board as of December 31, 2022, see the sub-section entitled "Outstanding Equity Awards at Fiscal Year-End for Non-Employee Directors."

(3) John McDonald was appointed to the Board in September 2022 and the amount in the Fees Earned or Paid in Cash column reflect compensation paid to Mr. McDonald, prorated for his partial year of service.

(4) Includes fees paid in stock in lieu of cash through the issuance of an aggregate 15,962 shares of Common Stock under the Directors Market Value Plan.

Equity Compensation

Terms of Awards

Pursuant to the Director Compensation Policy, each individual who first becomes a non-employee director receives an initial stock option grant and thereafter each non-employee director is eligible to receive stock option grants on an annual basis and such stock options are currently granted pursuant to our 2018 Equity Incentive Plan. In the first quarter of 2022, the Board approved the following changes to the Director Compensation Policy: (a) increase the size of the Initial Grant from 120,000 shares to 200,000 shares of Common Stock, and (b) increase the size of the Annual Grant from 83,000 shares to 125,000 shares of Common Stock. The following describes the equity compensation arrangements as outlined in the Director Compensation Policy in effect for the 2022 fiscal year:

- *Initial Grant.* Each individual who first becomes a non-employee director, whether by election by Geron's stockholders or by appointment by the Board to fill a vacancy, automatically will be granted an option to purchase shares of Common Stock on the date such individual first becomes a non-employee director (the "Initial Grant"), which such Initial Grant covers 200,000 shares of Common Stock. The Initial Grant vests annually over three years upon each anniversary of the date of appointment to the Board, subject to the non-employee director's continuous service through each applicable vesting date.

- *Annual Grant.* On the date of each annual meeting of our stockholders, each non-employee director (other than any director receiving an Initial Grant on the date of such annual meeting) who is then serving as a non-employee director and who will continue as a non-employee director following the date of such annual meeting automatically will be granted an option to purchase shares of our Common Stock (the "Annual Grant") which Annual Grant covers 125,000 shares of Common Stock. The Annual Grant vests in full on the earlier of (i) the date of the next annual meeting of our stockholders or (ii) the first anniversary of the date of grant, subject to the non-employee director's continuous service through such applicable vesting date.
- *Exercise Price and Term of Options.* The exercise price of all stock options granted under our 2018 Equity Incentive Plan is equal to the fair market value of a share of our Common Stock as determined under our 2018 Equity Incentive Plan. Stock options granted under our 2018 Equity Incentive Plan have a term of ten years from the date of grant, unless terminated earlier.
- *Exercise Period Post-Termination.* The stock options granted to non-employee directors pursuant to our 2018 Equity Incentive Plan remain exercisable until the earlier of the original expiration date of the stock option or 36 months following the optionee's termination of service as our non-employee director.

Under the Directors Market Value Plan, to the extent permitted by the Director Compensation Policy, the cash compensation payable to a non-employee director, who has properly and timely elected to receive such cash compensation instead in the form of shares of our Common Stock, will be used to purchase shares of Common Stock from Geron under the Directors Market Value Plan on the date that such cash compensation is payable to the non-employee director under the Director Compensation Policy.

Effect of Certain Corporate and Termination Events

As set forth in each stock option agreement under our 2018 Equity Incentive Plan, the vesting for each Initial Grant and Annual Grant will accelerate in full in the event of a Change in Control of Geron (as defined in our 2018 Equity Incentive Plan and described below under the sub-section entitled "Severance and Change in Control Benefits"). In addition, in the event a non-employee director experiences a termination of service as a result of such director's total and permanent disability (as defined in Section 22(e)(3) of the Internal Revenue Code of 1986, as amended (the "Code")) or death, the portion of each outstanding stock option held by such director that would have vested during the 36 months after the date of such director's termination of service, will automatically vest.

Stock Option Grants to Non-Employee Directors in 2022

The table below sets forth the following information with respect to our non-employee directors (seven persons) for the 2022 fiscal year: (i) stock options granted under our 2018 Equity Incentive Plan; and (ii) the grant date fair value of stock options granted.

Non-Employee Director	Grant Date	Option Awards Granted During 2022 (#)	Grant Date Fair Value of Option Awards Granted During 2022 ($)[1]
Bir, Dawn	5/10/22	125,000[2]	125,200
Eastham, Karin	5/10/22	125,000[2]	125,200
Lawlis, V. Bryan	5/10/22	125,000[2]	125,200
McDonald, John	9/7/22	200,000[3]	375,880
Molineaux, Susan	5/10/22	125,000[2]	125,200
O'Farrell, Elizabeth	5/10/22	125,000[2]	125,200
Spiegel, Robert	5/10/22	125,000[2]	125,200

(1) Amounts do not reflect dollar amounts actually received by our non-employee directors and instead, in accordance with SEC rules, represent the grant date fair value of each stock option granted in the 2022 fiscal year calculated in accordance with FASB ASC Topic 718. Refer to Note 9 of the consolidated financial statements in our Annual Report on Form 10-K for the year ended December 31, 2022 regarding assumptions underlying the valuation of stock option awards and the calculation method.

(2) Stock options vest on the earlier of: (i) the date of the next annual meeting or (ii) the first anniversary of the date of grant of such stock option, subject to the non-employee director's continuous service to the Company through such applicable vesting date.

(3) In connection with his appointment to the Board in September 2022, John McDonald was granted an Initial Grant of 200,000 shares of Common Stock in accordance with our Director Compensation Policy. Such stock option vests annually over three years from the date of Mr. McDonald's appointment to the Board, subject to his continued service to Geron.

Outstanding Equity Awards at Fiscal Year-End for Non-Employee Directors

The following table sets forth stock options outstanding for each non-employee director included in the Director Compensation Table above as of December 31, 2022.

Non-Employee Director	Option Awards Outstanding as of December 31, 2022
Bir, Dawn	481,000
Eastham, Karin	636,000
Lawlis, V. Bryan	636,000
McDonald, John	200,000
Molineaux, Susan	636,000
O'Farrell, Elizabeth	481,000
Spiegel, Robert	566,000

PROPOSAL 2

APPROVAL OF AN AMENDMENT TO OUR RESTATED CERTIFICATE OF INCORPORATION TO INCREASE THE TOTAL NUMBER OF AUTHORIZED SHARES OF COMMON STOCK

The Board has determined that it is in the Company's best interests and in the best interests of our stockholders to amend our Restated Certificate of Incorporation to increase our authorized number of shares of Common Stock from 675,000,000 shares to 1,350,000,000 shares. In March 2023, the Board adopted resolutions approving the proposed amendment to our Restated Certificate of Incorporation, in substantially the form of Appendix A hereto. At that time, the Board determined the proposed amendment and increase of the Common Stock to be advisable and in the best interests of the Company and our stockholders and is accordingly submitting the proposed amendment and increase of the Common Stock for approval by our stockholders.

If stockholders approve this proposal, we expect to file the amendment to our Restated Certificate of Incorporation with the Secretary of State of the State of Delaware to increase the total number of authorized shares of our Common Stock as soon as practicable following stockholder approval. In this regard, upon filing of the amendment to our Restated Certificate of Incorporation with the Secretary of State of the State of Delaware, Section A of Article IV of the Restated Certificate of Incorporation would be amended as follows, with the proposed additions double-underlined and proposed deletions stricken through:

"(A) Class of Stock. The Corporation is authorized to issue two classes of stock to be designated, respectively, "Common Stock" and "Preferred Stock." The total number of shares which the Corporation is authorized to issue is ~~Six Hundred and Seventy-Eight Million (678,000,000)~~ One Billion Three Hundred and Fifty-Three Million (1,353,000,000) shares. ~~Six Hundred and Seventy-Five Million (675,000,000)~~ One Billion Three Hundred and Fifty Million (1,350,000,000) shares shall be Common Stock, par value $0.001 per share, and Three Million (3,000,000) shares shall be Preferred Stock, par value $0.001 per share."

Of the 675,000,000 shares of our Common Stock currently authorized for issuance, as of the close of business on March 1, 2023, there were 508,684,887 shares of Common Stock issued and outstanding, which does not include the following:

- 72,876,186 shares of our Common Stock issuable upon the exercise of options outstanding, having a weighted-average exercise price of $2.07 per share;
- 51,430,477 shares of our Common Stock issuable upon the exercise of an outstanding pre-funded warrants with an exercise price of $0.001 per share;
- 34,841,171 shares of our Common Stock issuable upon the exercise of outstanding warrants with a weighted average exercise price of $1.42 per share; and
- an aggregate of 7,097,278 shares of our Common Stock reserved for future issuance under our 2014 Employee Stock Purchase Plan, our 2018 Equity Incentive Plan, or the 2018 Plan (not including the 43,360,000 new shares available for grant requested as part of Proposal 3), the Directors Market Value Plan, and our 2018 Inducement Award Plan.

Given our currently issued and outstanding shares and shares reserved for future issuance, we effectively have no available unissued and unreserved authorized shares to meet the needs of our business. Accordingly, if we are unable to obtain approval of this Proposal 2, our business, our prospects and the future of imetelstat could be severely and irreparably harmed.

The proposed amendment to our Restated Certificate of Incorporation would increase the number of shares of Common Stock that we are authorized to issue from 675,000,000 shares of Common Stock to 1,350,000,000 shares of Common Stock, representing an increase of 675,000,000 shares of authorized Common Stock, with a corresponding increase in the total authorized capital stock, which includes Common Stock and Preferred Stock, from 678,000,000 shares to 1,353,000,000 shares.

Reasons for the Increase in Authorized Shares

Over the past several years, our authorized Common Stock has allowed us the flexibility to pursue a number of financing transactions that were key to support advancement of the imetelstat program, while at the

same time enabling us to continue to provide the employee equity incentives that we deem necessary to attract and retain key employees. Unless stockholders approve this proposal, we will effectively not have *any* unissued and unreserved authorized shares of Common Stock to support the growth needed to obtain regulatory approval and conduct the activities necessary to potentially commercialize imetelstat by engaging in similar financing transactions in the future, as well as to respond to compensatory needs by implementing new or revised equity compensation plans or arrangements, all of which could severely and irreparably harm our business, our prospects and the future of imetelstat.

Geron is pursuing therapies with the potential to extend and enrich the lives of patients living with hematologic malignancies. Our investigational first-in-class telomerase inhibitor, imetelstat, harnesses Nobel Prize winning science in a treatment that may alter the underlying course of these diseases. Our lead indication for imetelstat is in lower risk MDS. In January 2023, we reported positive top-line results from our IMerge Phase 3 clinical trial. The trial met its primary endpoint of 8-week transfusion independence rate and a key secondary endpoint of 24-week transfusion independence rate, demonstrating highly statistically significant (i.e., $P<0.001$ for both) and clinically meaningful benefits in imetelstat versus placebo. Furthermore, statistically significant and clinically meaningful efficacy results were observed in the trial across key subtypes, including patients who were ringed sideroblast positive, or RS positive, and ringed sideroblast negative, or RS negative; patients with high and very high baseline transfusion burden; and patients classified as Low or Intermediate-1 risk according to the International Prognostic Scoring System, or IPSS.

Based on the positive top-line data from IMerge Phase 3 and the prior IMerge Phase 2, we plan to submit a New Drug Application, or NDA, to the Food and Drug Administration, or the FDA, in the United States, or U.S., in mid-2023 and a marketing authorization application, or MAA, in Europe in the second half of 2023 for the use of imetelstat in adult patients with lower risk MDS. If the NDA is accepted for filing and imetelstat is approved for commercialization by the FDA within the timelines we expect, we anticipate commercial launch of imetelstat in lower risk MDS in the U.S. could occur in the first half of 2024. In Europe, we anticipate review of the planned MAA, if validated by the European Medicines Agency, or EMA, could take approximately 14 months and, if approved, we anticipate that the commercial launch of imetelstat in lower risk MDS in Europe could occur by the end of 2024.

In addition to lower risk MDS, we are developing imetelstat for the treatment of several myeloid hematologic malignancies with the following ongoing clinical trials:

- IMpactMF, a Phase 3 clinical trial in relapsed/refractory MF with overall survival, or OS, as the primary endpoint, that currently is enrolling patients. Based on our planning assumptions for enrollment and event (death) rates in the trial, we expect the interim analysis for OS in IMpactMF may occur in 2024, and the final analysis may occur in 2025. Because these analyses are event-driven and it is uncertain whether actual rates for enrollment and events will reflect current planning assumptions, the results may be available at different times than currently expected.
- IMproveMF, a Phase 1 combination clinical trial in first-line Intermediate-1, Intermediate-2 or High-Risk myelofibrosis, or frontline MF, that currently is enrolling patients and the first patient was dosed in April 2021; and
- IMpress, an investigator-led Phase 2 clinical trial in Intermediate-2 or High-Risk myelodysplastic syndromes, or higher risk MDS, and acute myeloid leukemia, or AML, with the initial clinical site planned to open in 2023.

Based on our current operating plan and our expectations regarding the timing of the submission and potential acceptance and approval of our planned NDA by the FDA for imetelstat in lower risk MDS and the potential commercialization in the U.S. for the use of imetelstat in adult patients with lower risk MDS, we believe that our existing cash, cash equivalents, restricted cash and current and noncurrent marketable securities, including the net cash proceeds from the recently closed underwritten public offering in January 2023 and the proceeds from the exercise of warrants received in the January and February 2023, will be sufficient to fund our projected operating requirements through the end of the third quarter of 2025, which includes potential U.S. commercial launch of imetelstat in lower risk MDS in the first half of 2024. In the absence of potential proceeds from exercises of currently outstanding warrants and potential drawdowns under the term loan facility, or Loan Agreement, with Hercules Capital Inc. and Silicon Valley Bank, or SVB, we will require substantial additional funding to further advance the imetelstat program, including through the completion of IMpactMF, IMproveMF and the investigator-led trial IMpress, as well as conducting the clinical, regulatory and potential commercialization activities necessary to potentially bring imetelstat to market in relapsed/refractory MF and

any other future indications, and our need for additional funds may arise sooner than planned. We cannot predict with any certainty whether and to what extent the outstanding warrants will be exercised for cash, or the timing or availability of additional funds under the Loan Agreement, if at all, particularly given the recent closure of SVB by banking regulators.

To date, we have not derived any revenue from sales of any products. Our operations to date have been limited to organizing and staffing our company, acquiring, developing and securing our technology, undertaking non-clinical studies and clinical trials of our sole product candidate, imetelstat, and past product candidates that we have subsequently discontinued, and engaging in research and development under collaboration agreements. Since our inception, we primarily have financed our operations through the sale of equity securities, interest income on our marketable securities and payments we received under our collaborative and licensing arrangements. We have no committed sources of capital. Until we can generate sufficient product revenues, if ever, we expect to finance future cash needs through public or private equity or equity-linked offerings, debt financings or collaboration and licensing arrangements (which arrangements can also involve the possibility of an equity investment).

As of the date of this proxy statement, the Board has no definitive plans, arrangements or understandings to issue any of the additional shares of Common Stock that would be available as a result of the approval of this Proposal 2, other than pursuant to our various employee and director equity plans, including in connection with the proposed increase in the number of shares of Common Stock issuable under the 2018 Plan, assuming Proposal 3 is approved by our stockholders, and pursuant to our At Market Issuance Sales Agreement, or the Sales Agreement, with B. Riley Securities, Inc., under which we may elect to issue and sell shares of our Common Stock having an aggregate offering price of up to approximately $83 million as of the date of this proxy statement (assuming we regain sufficient unissued and unserved shares of Common Stock to effect further sales under the Sales Agreement, including as a result of the potential approval of this Proposal 2 by our stockholders). Our Board believes it is necessary to have additional shares available to provide further flexibility to promptly and appropriately use our Common Stock for business and financial purposes in the future, as well as to have sufficient shares available to provide appropriate equity incentives for current and future employees and other eligible service providers, as discussed in more detail in Proposal 3. The additional shares of Common Stock, if approved, may be used for various purposes without further stockholder approval. These purposes may include raising capital; providing equity incentives to employees, officers, directors, consultants and/or advisors; establishing licensing arrangements with other companies; expanding our business through the acquisition of other businesses, products or technologies; and other purposes.

If the Board determines that raising additional capital through issuing the additional shares of Common Stock is desirable, we want to be able to act quickly if market conditions are favorable. Given the lack of unissued and unserved shares of our Common Stock available for issuance, we may not be able to raise future capital, including pursuant to the Sales Agreement, without first obtaining stockholder approval for an increase in the number of authorized shares of Common Stock. The cost, prior notice requirements and delay involved in obtaining stockholder approval at the time that corporate action may be necessary or desirable could eliminate our ability to opportunistically capitalize on market windows. In addition, our success depends in part on our continued ability to attract, retain and motivate highly qualified management, clinical and commercial personnel, and if this proposal is not approved by our stockholders, the lack of sufficient unissued and unreserved authorized shares of Common Stock to provide future equity incentive opportunities that the Compensation Committee deems appropriate, including in connection with any approval of Proposal 3 by our stockholders, could adversely impact our ability to achieve these goals. In this regard, because of the lack of sufficient unissued and unserved shares of Common Stock, even if Proposal 3 is approved by our stockholders, the increase in the shares available for grant under the 2018 Plan, or the share reserve increase, will not become effective until the effectiveness of an amendment to our Restated Certificate of Incorporation to increase our authorized number of shares of Common Stock in at least an amount sufficient to cover the share reserve increase. Accordingly, even if Proposal 3 is approved by our stockholders, if our stockholders do not also approve this Proposal 2, then we would again need to seek the approval of our stockholders to amend the Restated Certificate of Incorporation to increase the number of authorized shares of our Common Stock and only after such approval is obtained and the related amendment to the Restated Certificate of Incorporation is effective would the share reserve increase become effective. We may be unable to do so in a timely matter or at all, in which case, even if Proposal 3 is approved by our stockholders, the effectiveness of the share reserve increase would be substantially delayed or precluded altogether, which would substantially impair our ability to continue to attract and retain the highly trained and experienced individuals who are critical to our success. In summary, if stockholders do not approve this proposal, we may not be able to access the capital markets; continue to conduct the research and development and clinical, regulatory and commercial activities necessary

to bring imetelstat to market; enter into licensing arrangements; attract, retain and motivate employees, officers, directors, consultants and/or advisors; and pursue other business opportunities that are integral and critical to our growth and success, all of which could severely harm our business, our prospects and the future of imetelstat.

Effects of the Increase in Authorized Shares

The additional Common Stock to be authorized by adoption of the amendment would have rights identical to the current outstanding Common Stock of the Company. Adoption of the proposed amendment and issuance of the Common Stock would not affect the rights of the holders of currently outstanding Common Stock, except for effects incidental to increasing the number of shares of the Common Stock outstanding, such as dilution of the earnings per share and voting rights of current holders of Common Stock. The additional shares of Common Stock authorized by the approval of this proposal could be issued by the Board without further vote of our stockholders except as may be required in particular cases by our Restated Certificate of Incorporation, applicable law, regulatory agencies or Nasdaq rules. Under our Restated Certificate of Incorporation, stockholders do not have preemptive rights to subscribe to additional securities that may be issued by us, which means that current stockholders do not have a prior right thereunder to purchase any new issue of Common Stock in order to maintain their proportionate ownership interests in the Company.

The increase in our authorized shares of Common Stock could also have an anti-takeover effect, in that additional shares could be issued (within the limits imposed by applicable law) in one or more transactions that could make a change in control or takeover of the Company difficult. For example, additional shares could be issued by us so as to dilute the stock ownership or voting rights of a person seeking to obtain control of the Company. Similarly, the issuance of additional shares to certain persons allied with our management could have the effect of making it more difficult to remove our management by diluting the stock ownership or voting rights of persons seeking to cause such removal. Although this proposal to approve the amendment of our Restated Certificate of Incorporation to increase the total number of authorized shares of Common Stock has been prompted by business and financial considerations and not by the threat of any hostile takeover attempt (nor is the Board currently aware of any such attempts directed at us), and the Board does not intend or view the proposed increase in the number of authorized shares of our Common Stock as an anti-takeover measure, stockholders should nevertheless be aware that approval of this proposal could facilitate future efforts by us to deter or prevent changes in control, including transactions in which our stockholders might otherwise receive a premium for their shares over then-current market prices.

Vote Required

The affirmative vote of the holders of a majority of outstanding shares of Common Stock entitled to vote on this proposal will be required to approve this proposal. Abstentions and broker non-votes will have the same effect as votes against this proposal.

The Board of Directors Unanimously Recommends That Stockholders Vote FOR Proposal 2

PROPOSAL 3

APPROVAL OF AMENDMENTS TO OUR 2018 EQUITY INCENTIVE PLAN

We are asking our stockholders to approve amendments to our 2018 Equity Incentive Plan, as amended (the "2018 Plan") at the Annual Meeting to, among other items:

(i) increase the number of shares issuable under the 2018 Plan by 43,360,000 shares of our Common Stock, which also constitutes a corresponding increase in the number of shares of our Common Stock available for issuance under the 2018 Plan pursuant to the exercise of incentive stock options (together, the "2018 Plan Share Increase"), with the 2018 Plan Share Increase to be effective upon the effectiveness of an amendment to our Restated Certificate of Incorporation to increase our authorized number of shares of Common Stock in at least an amount sufficient to cover the 2018 Plan Share Increase;

(ii) change the fungible share counting ratio so that the share reserve will be reduced or increased by 1.3 shares for each share of Common Stock issued pursuant to, or returning from, a Full Value Award (as defined below) (the "Fungible Share Amendment"); and

(iii) establish 171,000,000 shares as the maximum number of shares that may be subject to awards granted in the form of "incentive stock options" as defined in Section 422 of the Code (the "ISO Limit Amendment").

In March 2023, the Board approved the foregoing amendments to the 2018 Plan and, subject to approval of the amendments from stockholders at this Annual Meeting, the amendments will ensure that we can continue to grant stock options in order to provide long-term incentives to current and future employees, non-employee directors and consultants. Our continued ability to offer equity awards under the 2018 Plan is critical to our ability to attract, motivate and retain qualified employees, non-employee directors and consultants, particularly as we grow to support potential commercialization of imetelstat and in light of the highly competitive market for talent in which we operate.

Shares Available for Future Awards

The Board believes that additional shares are necessary to meet our anticipated equity compensation needs. The proposed increase is expected to last approximately two years. This estimate is based on a forecast that takes into account our anticipated rate of growth in hiring, required stock option grants under the Director Compensation Policy, and our historical forfeiture rates.

The 2018 Plan was initially adopted by the Board in March 2018 and approved by our stockholders in May 2018. The Board approved amendments to the 2018 Plan in February 2020, February 2021 and February 2022 to increase the total number of shares of Common Stock issuable thereunder by 5,700,000 shares, 12,500,000 shares, and 11,000,000 shares respectively. These amendments were approved by our stockholders in June 2020, May 2021 and May 2022, respectively.

Upon adoption, the 2018 Plan had an initial new share reserve of 10,000,000 shares of Common Stock. The aggregate number of shares of our Common Stock that may be issued under the 2018 Plan also included, as of the effective date of the 2018 Plan: (i) 2,895,419 unallocated shares that were remaining available for the grant of awards under our 2011 Equity Incentive Plan (the "2011 Plan") as of the effective date of the 2018 Plan in May 2018; and (ii) certain shares subject to outstanding awards granted under the 2011 Plan and our 1992 Stock Option Plan, our 1996 Directors' Stock Option Plan and our Amended and Restated 2002 Equity Incentive Plan (together, the "Prior Plans") that may become available for grant under the 2018 Plan as such shares become available from time to time (as further described below under "Summary of the 2018 Equity Incentive Plan – Stock Subject to the 2018 Plan"). In June 2020, May 2021 and May 2022, our stockholders approved amendments to the 2018 Plan to increase the share reserve by 5,700,000 shares, 12,500,000 shares and 11,000,000 shares, respectively. As of March 1, 2023, only 931,210 shares remained available for grant under the 2018 Plan (plus the Prior Plans' Returning Shares (as defined and further described below under "Summary of the 2018 Equity Incentive Plan – Stock Subject to the 2018 Plan") as such shares become available from time to time).

Why We are Asking our Stockholders to Approve the Amendments to the 2018 Plan

Equity Awards Are a Key Component of Our Compensation Philosophy

Our Board believes that the issuance of equity awards is a key element underlying our ability to attract, retain and motivate key personnel, non-employee directors and consultants because of the strong competition for highly trained and experienced individuals among biotechnology companies, especially in the San Francisco Bay Area and northern New Jersey. In addition, because of the highly regulated and complex industry that we operate in, our success depends on our ability to attract and retain individuals with deep experience in our industry. Without such key personnel, non-employee directors and consultants, we might not achieve our development and commercialization plans. Therefore, the Board believes that the proposed amendment to the 2018 Plan to increase the number of shares issuable under the 2018 Plan is in the best interests of the Company and its stockholders and recommends a vote in favor of this Proposal 3.

Approval by our stockholders of the proposed amendment to increase the number of shares issuable under the 2018 Plan will allow us to continue to attract and retain highly trained and experienced individuals who are critical to our success, through the grant of equity awards at levels determined appropriate by our Board or Compensation Committee. The amended 2018 Plan will also allow us to utilize equity awards as long-term incentives to secure and retain the services of current and future employees, non-employee directors and consultants, consistent with our compensation philosophy and common compensation practice for companies located in the San Francisco Bay Area and northern New Jersey. To date, we have relied significantly on equity awards in the form of stock option grants to attract and retain key employees, non-employee directors and consultants, all of whom are critical to our success. We believe the use of stock option grants strongly aligns the interests of our employees with those of our stockholders by placing a considerable proportion of our employees' total compensation "at risk" because their compensation, in the form of stock options, is contingent on the appreciation in value of our Common Stock. In addition, we believe stock option grants encourage employee ownership in the Company and promote retention through the reward of long-term value accretion.

Proposed Modification to the Fungible Plan Design

The 2018 Plan contains a "fungible share counting" structure. We originally adopted the 2018 Plan design in 2018 after consultation with advisors to determine what structure would best align the interests of the Company and its stockholders. This 2018 Plan structure offers the Company flexibility in determining what types of equity awards are best suited for its needs within the overall authorized share pool, recognizing that certain types of awards may be more valuable than others. Accordingly, for purposes of determining the number of shares available under the 2018 Plan, stock-based awards other than stock options and stock appreciation rights ("Full Value Awards") are counted against the authorized share pool differently than stock options and stock appreciation rights. Under the 2018 Plan the number of shares of our Common Stock available for issuance is reduced by (i) 1.0 share for each share issued pursuant to a stock option or stock appreciation right with an exercise price that is at least 100% of the fair market value of our Common Stock on the date of grant. However, each share of our Common Stock issued pursuant to a stock award that is a Full Value Award reduces the number of shares of our Common Stock available for issuance by 2.0 shares for each share issued pursuant to a Full Value Award. Similarly, the number of shares of our Common Stock available for issuance under the 2018 Plan is increased by (i) 1.0 share for each share that becomes available again for issuance under the terms of the 2018 Plan subject to a stock option or stock appreciation right and (ii) 2.0 shares for each share that becomes available again for issuance under the terms of the 2018 Plan subject to a Full Value Award.

We are proposing that the fungible share factor for Full Value Awards be reduced from 2.0 shares to 1.3 shares, so that each share of Common Stock issued after approval of this Proposal 3 pursuant to Full Value Awards would reduce the number of shares available out of the authorized share pool by 1.3 shares and each share of Common Stock that becomes available again for issuance under the terms of the 2018 Plan subject to a Full Value Award after approval of this Proposal 3 would increase the number of shares available out of the authorized share pool by 1.3 shares. The Board is recommending this change to the 2018 Plan because it believes the revised fungible share factor more accurately reflects the relative value of awards such as restricted stock and restricted stock units as compared to stock options. In reaching this conclusion, the Board reviewed the fungible share factors used by other peer companies and considered recent volatility of the market price of our Common Stock and other factors it deemed relevant.

Why You Should Vote to Approve the Amendments to the 2018 Plan

The 2018 Plan Requires Additional Shares to Meet our Forecasted Equity Needs

As described above, the 2018 Plan had 931,210 shares remaining available for grant as of March 1, 2023 (plus the Prior Plans' Returning Shares (as defined and further described below under "Summary of the 2018 Equity Incentive Plan – Stock Subject to the 2018 Plan") as such shares become available from time to time). Subject to adjustment for certain changes in our capitalization, if this Proposal 3 is approved by our stockholders, then under the 2018 Plan, we will have 43,360,000 new shares available for grant after our Annual Meeting for a total of approximately 44,291,210 shares available for grant after our Annual Meeting (based on shares available under the 2018 Plan as of March 1, 2023) (plus the Prior Plans' Returning Shares (as defined and further described below under "Summary of the 2018 Equity Incentive Plan – Stock Subject to the 2018 Plan") as such shares become available from time to time).

Our 2018 Inducement Award Plan (the "Inducement Plan") allows us to grant nonstatutory stock options to new employees as a material inducement to their joining the Company. Such grants to new employees assist us in meeting a portion of our equity compensation needs, but only with respect to a limited group. To meet the growing hiring needs of the Company, the Compensation Committee approved increases to the Inducement Plan share reserve of 5,000,000 shares, 1,300,000 shares, 800,000 shares, 5,000,000 shares, 1,000,000 shares, and 5,000,000 shares in January 2019, February 2020, February 2021, May 2021, February 2022, and July 2022, respectively. We expect to hire additional employees as we prepare for potential commercialization of imetelstat, including highly trained individuals with experience in commercial functions, such as pricing, market analytics and marketing, as well a U.S.-based sales force. As of March 1, 2023, 4,118,185 shares remained available for grant in the Inducement Plan.

We currently forecast granting stock options representing approximately 17,700,000 shares over the next one-year period, or approximately 3.5% of our Common Stock outstanding as of March 1, 2023, which reflects the increased headcount from 18 employees in January 2018 to over 110 employees as of March 1, 2023 to support the late-stage development of imetelstat with two ongoing Phase 3 clinical trials, as well as preparing regulatory submissions to seek approval for imetelstat given the positive top-line results reported in early January 2023 from a Phase 3 clinical trial, and building the infrastructure and hiring the talent for potential commercialization in the United States.

We also anticipate stock option cancellations of approximately 96,000 shares in 2023 based on current projections. If our expectation for forfeitures is accurate, our net stock option grants (grants less forfeitures and cancellations) over the next one-year period will be approximately 17,604,000 shares, or approximately 3.5% of our Common Stock outstanding as of March 1, 2023.

We currently intend to reserve the additional shares being requested under this Proposal 3 for issuance under our 2018 Plan to meet our estimated near-term equity compensation needs for our current and future employees, non-employee directors and consultants.

We operate in a highly competitive industry and geographies for employee talent and do not expect required rates of compensation to decline. One alternative to using equity awards would be to significantly increase cash compensation. We do not believe this would be in our best interests or the best interests of our stockholders, because it would significantly impact our financial resources to further advance the imetelstat program. As a biotechnology company with locations in the San Francisco Bay Area and northern New Jersey, we believe that a combination of equity and cash compensation is more appropriate and preferable and meets the expected regional recruiting standards needed to enable us to attract, retain and motivate employees. Any significant increase in cash compensation in lieu of equity awards would reduce the cash otherwise available for advancing the development of imetelstat and potential commercial activities. Furthermore, we do not believe a cash-oriented compensation program would provide the same value to us or our stockholders with respect to long-term employee retention or serve to align employees' interests with those of our stockholders, in comparison to a program that includes equity awards.

We Carefully Manage the Use of Equity Awards, and the Size of our Share Reserve is Reasonable

Our compensation philosophy reflects broad-based eligibility for equity awards, and we grant stock options to all of our employees and non-employee directors. However, we recognize that stock options dilute existing stockholders, and, therefore, we responsibly manage the growth of our equity compensation program. We are committed to effectively monitoring the share reserves for our equity plans, including our "burn rate," to

ensure that we maximize stockholders' value by granting the appropriate number of stock options necessary to attract, reward, and retain employees, non-employee directors and consultants. Despite the fact that many of our stock options have exercise prices greater than the closing price of our Common Stock as reported by the Nasdaq Global Select Market in 2022, we have not repriced any stock options. In addition, the current burn rate and stock options outstanding reflects the recent growth of the Company as we rebuild internal capabilities through hiring to advance development of imetelstat and prepare for potential commercialization of imetelstat. In 2022, 2021 and 2020, we recruited highly qualified and experienced professionals to drive each development function, including clinical operations, regulatory affairs, clinical science, biometrics and data management, manufacturing, quality, translational research, program management to support the late-stage development of imetelstat, as well as administrative functions, including commercial, medical affairs and market access, to support potential commercialization of imetelstat.

The tables below show our historical overhang and burn rate percentages under the current 2018 Plan and reflect the responsible actions we have taken in the past regarding our stock option grants.

Equity Awards Outstanding and Overhang

	As of March 1, 2023
2018 Plan Information	
Total number of shares of Common Stock subject to outstanding stock options	43,850,282
Weighted-average exercise price of outstanding stock options	$ 1.81
Weighted-average remaining term of outstanding stock options	8.3 years
Total number of shares of Common Stock subject to outstanding full value awards	None
Total number of shares of Common Stock available for grant	931,210
Plan Information for Other Equity Plans	
Total number of shares of Common Stock subject to outstanding stock options	29,025,904
Weighted-average exercise price of outstanding stock options	$ 2.46
Weighted-average remaining term of outstanding stock options	5.6 years
Total number of shares of Common Stock subject to outstanding full value awards	None
Total number of shares of Common Stock available for grant(1)	4,118,185
Total number of shares of Common Stock outstanding	508,684,887
Per-share closing price of Common Stock as reported on the Nasdaq Global Select Market	$ 2.78

(1) Excludes 1,131,764 shares available under the 2014 Employee Stock Purchase Plan and 916,119 shares available under the Directors' Market Value Purchase Plan.

Burn Rate

The following table provides detailed information regarding the activity related to our 2018 Plan for the 2022 fiscal year.

	For the Year Ended December 31, 2022
Total number of shares of Common Stock subject to stock options granted	14,474,080(1)
Total number of shares of Common Stock subject to full value awards granted	—
Weighted-average number of shares of Common Stock outstanding	380,784,846
Burn rate	3.8%

(1) Includes 2,356,180 shares subject to stock options granted with vesting conditioned upon achievement of certain performance milestones.

The 2018 Plan Incorporates Good Compensation and Governance Practices

The 2018 Plan includes many provisions designed to protect our stockholders' interests and to reflect corporate governance best practices.

- *Administration by the Board or an independent committee of the Board*. The 2018 Plan is administered by our Board, which may delegate authority to administer the 2018 Plan to an independent Board committee. The Board has delegated authority to administer the 2018 Plan to the Compensation Committee, which consists of three "non-employee directors" within the meaning of Rule 16b-3 under the Securities Exchange Act of 1934, as amended (the "Exchange Act"). The Board retains the authority to concurrently administer the 2018 Plan and may, at any time, revest in the Board some or all of the powers previously delegated to the Compensation Committee or any other committee.
- *Repricing is not allowed*. The 2018 Plan prohibits the repricing of outstanding stock options and stock appreciation rights, and the cancellation of any outstanding stock options or stock appreciation rights that have an exercise or strike price greater than the then-current fair market value of our Common Stock in exchange for cash or other stock awards under the 2018 Plan, without prior stockholder approval.
- *Stockholder approval is required for additional shares or any material amendment*. The 2018 Plan does not contain an annual "evergreen" provision. The 2018 Plan authorizes a fixed number of shares, so that stockholder approval is required to issue any additional shares, allowing our stockholders to have direct input on our equity compensation program. Consistent with Nasdaq rules, the 2018 Plan requires stockholder approval of any material revisions to the 2018 Plan. In addition, certain other amendments to the 2018 Plan require stockholder approval.
- *Awards subject to forfeiture/clawback*. Awards granted under the 2018 Plan are subject to recoupment in accordance with any clawback provisions in a participant's employment agreement or other agreement with the Company, or any clawback policy that we are required to adopt pursuant to the listing standards of any national securities exchange or association on which our securities are listed or as is otherwise required by the Dodd-Frank Wall Street Reform and Consumer Protection Act or other applicable law. In addition, we may impose other clawback, recovery or recoupment provisions in a stock award agreement, including a reacquisition right in respect of previously acquired shares or other cash or property upon the occurrence of cause.
- *No single trigger accelerated vesting upon change in control*. The 2018 Plan does not provide for any automatic mandatory vesting of awards upon a change in control.
- *No liberal change in control definition*. The change in control definition in the 2018 Plan is not a "liberal" definition. A change in control transaction must actually occur in order for the change in control provisions in the 2018 Plan to be triggered.
- *No discounted stock options or stock appreciation rights*. All stock options and stock appreciation rights granted under the 2018 Plan must have an exercise or strike price equal to or greater than the fair market value of our Common Stock on the date the stock option or stock appreciation right is granted.
- *No liberal share counting or recycling of appreciation awards*. The following shares will not become available again for issuance under the 2018 Plan: (i) shares underlying stock options or stock appreciation rights that are reacquired or withheld (or not issued) by us to satisfy the exercise or purchase price of a stock award; (ii) shares underlying stock options or stock appreciation rights that are reacquired or withheld (or not issued) by us to satisfy a tax withholding obligation in connection with a stock award; and (iii) any shares repurchased by us on the open market with the proceeds of the exercise or purchase price of a stock option or a stock appreciation right.
- *Fungible share counting.* The number of shares of our Common Stock available for issuance under the 2018 Plan will be reduced by (i) 1.0 share for each share issued pursuant to stock options or stock appreciation rights granted under the 2018 Plan and (ii) 1.3 shares for each share issued pursuant to a Full Value Award granted under the 2018 Plan, if proposed amendments to the 2018 Plan are approved by stockholders under this Proposal 3, otherwise 2.0 shares. As part of such fungible share counting structure, the number of shares of our Common Stock available for issuance under the 2018 Plan will be increased by (i) 1.0 share for each share that becomes available again for issuance under the terms of the 2018 Plan subject to a stock option or stock appreciation right award and (ii) 1.3

shares for each share that becomes available again for issuance under the terms of the 2018 Plan subject to a Full Value Award, if proposed amendments to the 2018 Plan are approved by stockholders under this Proposal 3, otherwise 2.0 shares.

- *Termination of stock options and stock appreciation rights on a participant's termination for cause*. If a participant's service is terminated for cause, which is defined under the 2018 Plan as (i) the participant's conviction of any crime involving fraud, dishonesty or moral turpitude; (ii) the participant's attempted commission of or participation in a fraud or act of dishonesty against the Company resulting in material harm to the business of the Company; (iii) the participant's intentional, material violation of any contract or agreement with the Company, or any statutory duty the participant owes to the Company; or (iv) the participant's conduct that constitutes gross misconduct, insubordination, incompetence or habitual neglect of duties and that results in material harm to the business of the Company, the participant's stock options and stock appreciation rights terminate immediately, and the participant is prohibited from exercising his or her stock options and stock appreciation rights.
- *Restrictions on dividends*. The 2018 Plan provides that (i) no dividends or dividend equivalents may be paid with respect to any shares of our Common Stock subject to a stock award before the date such shares have vested, (ii) any dividends or dividend equivalents that are credited with respect to any such shares will be subject to all of the terms and conditions applicable to such shares under the terms of the applicable stock award agreement (including any vesting conditions), and (iii) any dividends or dividend equivalents that are credited with respect to any such shares will be forfeited to us on the date such shares are forfeited to or repurchased by us due to a failure to vest.

Summary of the 2018 Equity Incentive Plan

The following is a summary of the principal features of the 2018 Plan, as amended, together with the applicable tax implications with respect to the 2018 Plan. The summary is qualified by reference to the full text of the 2018 Plan, as amended, which is attached as Appendix B to this Proxy Statement.

General

The 2018 Plan provides for grants to employees of our Company and any parent or subsidiary of our Company (including officers and employee directors) of "incentive stock options" within the meaning of Section 422 of the Code, and for grants of non-qualified stock options and stock purchase rights to employees (including officers and employee directors) and consultants (including non-employee directors) of our Company or any parent or subsidiary of our Company. See "Federal Income Tax Aspects" below for information concerning the tax treatment of incentive stock options, non-qualified stock options and stock purchase rights.

Purpose

The 2018 Plan is designed to secure and retain the services of our employees, non-employee directors and consultants, provide incentives for our employees, non-employee directors and consultants to exert maximum efforts for the success of our Company and our affiliates, and provide a means by which our employees, non-employee directors and consultants may be given an opportunity to benefit from increases in the value of our Common Stock. The 2018 Plan is also designed to align employees' interests with stockholder interests.

Administration

The 2018 Plan is administered by our Board, which may in turn delegate authority to administer the 2018 Plan to a committee of non-employee directors. The Board has delegated authority to administer the 2018 Plan to the Compensation Committee of the Board. Our Board may, at any time, revest in itself some or all of the power delegated to such a committee. The Board and any committee of non-employee directors to whom the Board may delegate authority to administer the 2018 Plan are each considered to be a Plan Administrator for purposes of this Proposal 3. Subject to the terms of the 2018 Plan, the Plan Administrator may determine the recipients, the types of stock awards to be granted, the number of shares of our Common Stock subject to or the cash value of stock awards, and the terms and conditions of stock awards granted under the 2018 Plan, including the period of their exercisability and vesting. The Plan Administrator also has the authority to provide for accelerated exercisability and vesting of stock awards. Subject to the limitations set forth below, the Plan

Administrator also determines the fair market value applicable to a stock award and the exercise or strike price of stock options and stock appreciation rights granted under the 2018 Plan.

The Plan Administrator may also delegate to one or more executive officers the authority to designate employees who are not executive officers to be recipients of certain stock awards and the number of shares of our Common Stock subject to such stock awards. Under any such delegation, the Plan Administrator will specify the total number of shares of our Common Stock that may be subject to the stock awards granted by such executive officer. The executive officer may not grant a stock award to himself or herself.

Eligibility

Employees, non-employee directors, and consultants are eligible to participate in the 2018 Plan. As of March 1, 2023, all of our 114 employees (including 5 executive officers), 7 non-employee directors (including currently serving and nominee non-employee directors) and approximately 90 consultants are currently eligible to participate in the 2018 Plan and may receive all types of stock awards other than incentive stock options, under the 2018 Plan. Incentive stock options may be granted under the 2018 Plan only to our employees, including our members of our executive management team.

Stock Subject to the 2018 Plan

Subject to adjustment for certain changes in our capitalization, the aggregate number of shares of our Common Stock that may be issued under the 2018 Plan (the "Share Reserve"), if this Proposal 3 is approved by our stockholders, will not exceed the sum of: (i) 2,895,419 (which is the number of unallocated shares that remained available for the grant of new stock awards under the 2011 Plan as of the effective date of the 2018 Plan), (ii) 10,000,000 shares (which is the number of new shares that were reserved as of the effective date of the 2018 Plan), (iii) the 5,700,000 shares approved by our stockholders in June 2020, (iv) the 12,500,000 shares approved by our stockholders in May 2021, (v) the 11,000,000 shares approved by our stockholders in May 2022, (vi) the 43,360,000 newly-requested shares that are the subject of this Proposal 3, and (vii) any Prior Plans' Returning Shares (as defined below), as such shares become available from time to time.

The "Prior Plans' Returning Shares" are shares subject to outstanding stock awards granted under the Prior Plans that, from and after the effective date of the 2018 Plan, (i) expire or terminate for any reason prior to exercise or settlement, (ii) are forfeited, cancelled or otherwise returned to us because of the failure to meet a contingency or condition required for the vesting of such shares, or (iii) other than with respect to outstanding stock options and stock appreciation rights granted under the Prior Plans with an exercise or strike price of at least 100% of the fair market value of the underlying Common Stock on the date of grant ("Prior Plans' Appreciation Awards"), are reacquired or withheld (or not issued) by us to satisfy a tax withholding obligation in connection with a stock award.

The number of shares of our Common Stock available for issuance under the 2018 Plan will be reduced by (i) one share for each share of Common Stock issued pursuant to a stock option or stock appreciation right with an exercise or strike price of at least 100% of the fair market value of the underlying Common Stock on the date of grant, and (ii) 1.3 shares for each share of Common Stock issued pursuant to a Full Value Award (i.e., any stock award that is not a stock option or stock appreciation right with an exercise or strike price of at least 100% of the fair market value of the underlying Common Stock on the date of grant), if proposed amendments to the 2018 Plan are approved by stockholders under this Proposal 3, otherwise 2.0 shares.

If (i) any shares of Common Stock subject to a stock award are not issued because the stock award expires or otherwise terminates without all of the shares covered by the stock award having been issued or is settled in cash, (ii) any shares of Common Stock issued pursuant to a stock award are forfeited back to or repurchased by us because of the failure to meet a contingency or condition required for the vesting of such shares, or (iii) with respect to a Full Value Award, any shares of Common Stock are reacquired or withheld (or not issued) by us to satisfy a tax withholding obligation in connection with the award, then such shares will again become available for issuance under the 2018 Plan (collectively, the "2018 Plan Returning Shares"). For each 2018 Plan Returning Share subject to a Full Value Award, or Prior Plans' Returning Share subject to a stock award other than a Prior Plans' Appreciation Award, the number of shares of Common Stock available for issuance under the 2018 Plan will increase by 1.3 shares, if proposed amendments to the 2018 Plan are approved by stockholders under this Proposal 3, otherwise 2.0 shares.

Any shares of Common Stock reacquired or withheld (or not issued) by us to satisfy the exercise or purchase price of a stock award will no longer be available for issuance under the 2018 Plan, including any shares subject to a stock award that are not delivered to a participant because the stock award is exercised through a reduction of shares subject to the stock award. In addition, any shares reacquired or withheld (or not issued) by us to satisfy a tax withholding obligation in connection with a stock option or stock appreciation right granted under the 2018 Plan or a Prior Plans' Appreciation Award, or any shares repurchased by us on the open market with the proceeds of the exercise or strike price of a stock option or stock appreciation right granted under the 2018 Plan or a Prior Plans' Appreciation Award will no longer be available for issuance under the 2018 Plan.

Subject to adjustment, as described below, no more than 171,000,000 shares of our Common Stock may be delivered in satisfaction of incentive stock options awarded under the 2018 Plan.

The Common Stock issuable under the 2018 Plan may be shares of authorized but unissued or reacquired Common Stock, including shares repurchased by our Company on the open market or otherwise. The closing price of our Common Stock, as reported on the Nasdaq Global Select Market on March 1, 2023, was $2.78 per share.

Repricing; Cancellation and Re-Grant of Stock Options or Stock Appreciation Rights

Under the 2018 Plan, the Plan Administrator does not have the authority to reprice any outstanding stock option or stock appreciation right by reducing the exercise or strike price of the stock option or stock appreciation right or to cancel any outstanding stock option or stock appreciation right that has an exercise or strike price greater than the then-current fair market value of our Common Stock in exchange for cash or other stock awards without obtaining the approval of our stockholders. Such approval must be obtained within 12 months prior to such an event.

Stock Options

Stock options may be granted under the 2018 Plan pursuant to stock option agreements. The 2018 Plan permits the grant of stock options that are intended to qualify as incentive stock options ("ISOs") and nonstatutory stock options ("NSOs").

The exercise price of a stock option granted under the 2018 Plan may not be less than 100% of the fair market value of the Common Stock subject to the stock option on the date of grant and, in some cases (see "Limitations on Incentive Stock Options" below), may not be less than 110% of such fair market value.

The term of stock options granted under the 2018 Plan may not exceed ten years and, in some cases (see "Limitations on Incentive Stock Options" below), may not exceed five years. Except as otherwise provided in a participant's stock option agreement or other written agreement with us, if a participant's service relationship with us (referred to in this Proposal 3 as "continuous service") terminates (other than for cause or the participant's death or disability), the participant may exercise any vested stock options for up to three months following the participant's termination of continuous service. Except as otherwise provided in a participant's stock option agreement or other written agreement with us, if a participant's continuous service terminates due to the participant's disability or death (or the participant dies within a specified period, if any, following termination of continuous service), the participant, or his or her beneficiary, as applicable, may exercise any vested stock options for up to 24 months following the participant's termination due to the participant's disability or following the participant's death. Except as explicitly provided otherwise in a participant's stock option agreement or other written agreement with us, if a participant's continuous service is terminated for cause (as defined in the 2018 Plan), all stock options held by the participant will terminate upon the participant's termination of continuous service and the participant will be prohibited from exercising any stock option from and after such termination date. Except as otherwise provided in a participant's stock option agreement or other written agreement with us, the term of a stock option may be extended if the exercise of the stock option following the participant's termination of continuous service (other than for cause or the participant's death or disability) would be prohibited by applicable securities laws or if the sale of any Common Stock received upon exercise of the stock option following the participant's termination of continuous service (other than for cause) would violate our insider trading policy. In no event, however, may a stock option be exercised after its original expiration date.

Acceptable forms of consideration for the purchase of our Common Stock pursuant to the exercise of a stock option under the 2018 Plan will be determined by the Plan Administrator and may include payment: (i) by cash, check, bank draft or money order payable to us; (ii) pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board; (iii) by delivery to us of shares of our Common Stock (either by actual delivery or attestation); (iv) by a net exercise arrangement (for NSOs only); or (v) in other legal consideration approved by the Plan Administrator.

Stock options granted under the 2018 Plan may become exercisable in cumulative increments, or "vest," as determined by the Plan Administrator at the rate specified in the stock option agreement. Shares covered by different stock options granted under the 2018 Plan may be subject to different vesting schedules as the Plan Administrator may determine.

The Plan Administrator may impose limitations on the transferability of stock options granted under the 2018 Plan in its discretion. Generally, a participant may not transfer a stock option granted under the 2018 Plan other than by will or the laws of descent and distribution or, subject to approval by the Plan Administrator, pursuant to a domestic relations order or an official marital settlement agreement. However, the Plan Administrator may permit transfer of a stock option in a manner that is not prohibited by applicable tax and securities laws. In addition, subject to approval by the Plan Administrator, a participant may designate a beneficiary who may exercise the stock option following the participant's death.

Limitations on Incentive Stock Options

In accordance with current federal tax laws, the aggregate fair market value, determined at the time of grant, of shares of our Common Stock with respect to ISOs that are exercisable for the first time by a participant during any calendar year under all of our equity incentive plans may not exceed $100,000. The stock options or portions of stock options that exceed this limit or otherwise fail to qualify as ISOs are treated as NSOs. No ISO may be granted to any person who, at the time of grant, owns or is deemed to own stock possessing more than 10% of our total combined voting power unless the following conditions are satisfied:

- the exercise price of the ISO must be at least 110% of the fair market value of the Common Stock subject to the ISO on the date of grant; and
- the term of the ISO must not exceed five years from the date of grant.

Subject to adjustment for certain changes in our capitalization, the aggregate maximum number of shares of our Common Stock that may be issued pursuant to the exercise of ISOs under the 2018 Plan is 171,000,000 shares, if the proposed amendments to the 2018 Plan are approved by stockholders under this Proposal 3, otherwise 95,000,000 shares.

Stock Appreciation Rights

Stock appreciation rights may be granted under the 2018 Plan pursuant to stock appreciation right agreements. Each stock appreciation right is denominated in common stock share equivalents. The strike price of each stock appreciation right will be determined by the Plan Administrator, but will in no event be less than 100% of the fair market value of the Common Stock subject to the stock appreciation right on the date of grant. The Plan Administrator may also impose restrictions or conditions upon the vesting of stock appreciation rights that it deems appropriate. The appreciation distribution payable upon exercise of a stock appreciation right may be paid in shares of our Common Stock, in cash, in a combination of cash and stock, or in any other form of consideration determined by the Plan Administrator and set forth in the stock appreciation right agreement. Stock appreciation rights will be subject to the same conditions upon termination of continuous service and restrictions on transfer as stock options under the 2018 Plan.

Restricted Stock Awards

Restricted stock awards may be granted under the 2018 Plan pursuant to restricted stock award agreements. A restricted stock award may be granted in consideration for cash, check, bank draft or money order payable to us, the participant's services performed for us, or any other form of legal consideration acceptable to the Plan Administrator. Shares of our Common Stock acquired under a restricted stock award may be subject to forfeiture to or repurchase by us in accordance with a vesting schedule to be determined by the Plan Administrator. Rights to acquire shares of our Common Stock under a restricted stock award may be transferred only upon such terms and conditions as are set forth in the restricted stock award agreement. A

restricted stock award agreement may provide that any dividends paid on restricted stock will be subject to the same vesting conditions as apply to the shares subject to the restricted stock award. Upon a participant's termination of continuous service for any reason, any shares subject to restricted stock awards held by the participant that have not vested as of such termination date may be forfeited to or repurchased by us.

Restricted Stock Unit Awards

Restricted stock unit awards may be granted under the 2018 Plan pursuant to restricted stock unit award agreements. Payment of any purchase price may be made in any form of legal consideration acceptable to the Plan Administrator. A restricted stock unit award may be settled by the delivery of shares of our Common Stock, in cash, in a combination of cash and stock, or in any other form of consideration determined by the Plan Administrator and set forth in the restricted stock unit award agreement. Restricted stock unit awards may be subject to vesting in accordance with a vesting schedule to be determined by the Plan Administrator. Dividend equivalents may be credited in respect of shares of our Common Stock covered by a restricted stock unit award, provided that any additional shares credited by reason of such dividend equivalents will be subject to all of the same terms and conditions of the underlying restricted stock unit award. Except as otherwise provided in a participant's restricted stock unit award agreement or other written agreement with us, restricted stock units that have not vested will be forfeited upon the participant's termination of continuous service for any reason.

Performance Awards

The 2018 Plan allows us to grant performance stock awards. A performance stock award is a stock award that is payable (including that may be granted, may vest, or may be exercised) contingent upon the attainment of pre-determined performance goals during a performance period. A performance stock award may require the completion of a specified period of continuous service. The length of any performance period, the performance goals to be achieved during the performance period, and the measure of whether and to what degree such performance goals have been attained will be determined by the Plan Administrator in its discretion. In addition, to the extent permitted by applicable law and the applicable stock award agreement, the Plan Administrator may determine that cash may be used in payment of performance stock awards.

Performance goals under the 2018 Plan will be based on any one or more of the following performance criteria: (i) net earnings (either before or after one or more of the following: (A) interest, (B) taxes, (C) depreciation and (D) amortization); (ii) gross or net sales or revenue; (iii) net income (either before or after taxes); (iv) adjusted net income; (v) operating earnings or profit; (vi) cash flow (including, but not limited to, operating cash flow and free cash flow); (vii) return on assets; (viii) return on capital; (ix) return on stockholders' equity; (x) total stockholder return; (xi) return on sales; (xii) gross or net profit or operating margin; (xiii) costs; (xiv) funds from operations; (xv) expenses; (xvi) working capital; (xvii) earnings per share; (xviii) adjusted earnings per share; (xix) price per share; (xx) regulatory body approval for commercialization of a product; (xxi) positive results from clinical trials; (xxii) initiation of clinical trials; (xxiii) implementation, completion or maintenance of critical projects or relationships; (xxiv) closing of significant financing; (xxv) execution or completion of strategic initiatives; (xxvi) market share; (xxvii) economic value; (xxviii) cash flow return on capital; (xxix) return on net assets; and (xxx) other measures of performance selected by the Plan Administrator.

Performance goals may be based on a company-wide basis, with respect to one or more business units, divisions, affiliates or business segments, and in either absolute terms or relative to the performance of one or more comparable companies or the performance of one or more relevant indices. The Plan Administrator may, in its sole discretion, provide that one or more objectively determinable adjustments shall be made to one or more of the performance goals. Such adjustments may include one or more of the following: (i) items related to a change in accounting principles; (ii) items relating to financing activities; (iii) expenses for restructuring or productivity initiatives; (iv) other non-operating items; (v) items related to acquisitions; (vi) items attributable to the business operations of any entity acquired by the Company during the performance period; (vii) items related to the disposal of a business or segment of a business; (viii) items related to discontinued operations that do not qualify as a segment of a business under applicable accounting standards; (ix) items attributable to any stock dividend, stock split, combination or exchange of stock occurring during the performance period; (x) any other items of significant income or expense which are determined to be appropriate adjustments; (xi) items relating to unusual or extraordinary corporate transactions, events or developments, (xii) items related to amortization of acquired intangible assets; (xiii) items that are outside the scope of the Company's core, on-going business activities; (xiv) items related to acquired in-process research and development; (xv) items relating to changes in tax laws; (xvi) items relating to major licensing or partnership arrangements; (xvii) items relating to asset impairment charges; (xviii) items relating to gains or losses for litigation, arbitration and

contractual settlements; (xix) items relating to any other unusual or nonrecurring events or changes in applicable laws, accounting principles or business conditions; or (xx) any other items selected by the Plan Administrator.

In addition, the Plan Administrator retains the discretion to reduce or eliminate the compensation or economic benefit due upon the attainment of any performance goals and to define the manner of calculating the performance criteria it selects to use for a performance period.

Other Stock Awards

Other forms of stock awards valued in whole or in part by reference to, or otherwise based on, our Common Stock may be granted either alone or in addition to other stock awards under the 2018 Plan. Subject to the terms of the 2018 Plan, the Plan Administrator will have sole and complete authority to determine the persons to whom and the time or times at which such other stock awards will be granted, the number of shares of our Common Stock to be granted and all other terms and conditions of such other stock awards.

Clawback Policy

Stock awards granted under the 2018 Plan will be subject to recoupment in accordance with any clawback provisions in a participant's employment agreement or other agreement with the Company or any clawback policy that we are required to adopt pursuant to the listing standards of any national securities exchange or association on which our securities are listed or as is otherwise required by the Dodd-Frank Wall Street Reform and Consumer Protection Act or other applicable law. In addition, the Plan Administrator may impose other clawback, recovery or recoupment provisions in a stock award agreement as the Plan Administrator determines necessary or appropriate, including a reacquisition right in respect of previously acquired shares of our Common Stock or other cash or property upon the occurrence of cause.

Changes to Capital Structure

In the event of certain capitalization adjustments, the Plan Administrator will appropriately adjust: (i) the class(es) and maximum number of securities subject to the 2018 Plan; (ii) the class(es) and maximum number of securities that may be issued pursuant to the exercise of ISOs; and (iii) the class(es) and number of securities and price per share of stock subject to outstanding stock awards.

Corporate Transaction

In the event of a corporate transaction (as defined in the 2018 Plan and described below), the Board will have the discretion to take one or more of the following actions with respect to outstanding stock awards (contingent upon the closing or completion of such corporate transaction), unless otherwise provided in the stock award agreement or other written agreement with the participant or unless otherwise provided by the Board at the time of grant:

- arrange for the surviving or acquiring corporation (or its parent company) to assume or continue the award or to substitute a similar stock award for the award (including an award to acquire the same consideration paid to our stockholders pursuant to the corporate transaction);
- arrange for the assignment of any reacquisition or repurchase rights held by us with respect to the stock award to the surviving or acquiring corporation (or its parent company);
- accelerate the vesting (and, if applicable, the exercisability) of the stock award and provide for its termination prior to the effective time of the corporate transaction;
- arrange for the lapse, in whole or in part, of any reacquisition or repurchase rights held by us with respect to the award;
- cancel or arrange for the cancellation of the stock award, to the extent not vested or exercised prior to the effective time of the corporate transaction, in exchange for such cash consideration, if any, as the Board may consider appropriate; and
- make a payment, in such form as may be determined by the Board, equal to the excess, if any, of (i) the value of the property the participant would have received upon the exercise of the stock award immediately prior to the effective time of the corporate transaction, over (ii) any exercise price payable in connection with such exercise.

The Board is not obligated to treat all stock awards or portions of stock awards in the same manner. The Board may take different actions with respect to the vested and unvested portions of a stock award.

For purposes of the 2018 Plan, a corporate transaction generally will be deemed to occur in the event of the consummation of: (i) a sale or other disposition of all or substantially all of our consolidated assets; (ii) a sale or other disposition of at least 90% of our outstanding securities; (iii) a merger, consolidation or similar transaction following which we are not the surviving corporation; or (iv) a reverse merger, consolidation or similar transaction following which we are the surviving corporation but the shares of our Common Stock outstanding immediately prior to the transaction are converted or exchanged into other property by virtue of the transaction.

Change in Control

Under the 2018 Plan, a stock award may be subject to additional acceleration of vesting and exercisability upon or after a change in control (as defined in the 2018 Plan and described below) as may be provided in the participant's stock award agreement, in any other written agreement with us or in our Director Compensation Policy, but in the absence of such provision, no such acceleration will occur.

For purposes of the 2018 Plan, a change in control generally will be deemed to occur upon the first to occur of an event set forth in any one of the following: (i) as a result of any merger or consolidation, the voting securities of the Company outstanding immediately prior thereto represent less than 49% of the combined voting power of the voting securities of the Company or such surviving or acquiring entity outstanding immediately after such transaction; (ii) a majority of our Board becomes comprised of individuals whose nomination, appointment, or election was not approved by at least two-thirds of the Board members or their approved successors; (iii) any individual, entity or group becomes the beneficial owner of more than 20% of the then outstanding shares of Common Stock of the Company; (iv) any sale of all or substantially all of the assets of the Company; or (v) the complete liquidation or dissolution of the Company.

The acceleration of vesting of a stock award in the event of a corporate transaction or a change in control event under the 2018 Plan may be viewed as an anti-takeover provision, which may have the effect of discouraging a proposal to acquire or otherwise obtain control of us.

Plan Amendments and Termination

The Plan Administrator will have the authority to amend or terminate the 2018 Plan at any time. However, except as otherwise provided in the 2018 Plan or a stock award agreement, no amendment or termination of the 2018 Plan may materially impair a participant's rights under his or her outstanding stock awards without the participant's consent. We will obtain stockholder approval of any amendment to the 2018 Plan as required by applicable law and listing requirements. No incentive stock options may be granted under the 2018 Plan after the tenth anniversary of the date the 2018 Plan was adopted by our Board.

U.S. Federal Income Tax Consequences

The following is a summary of the principal United States federal income tax consequences to participants and us with respect to participation in the 2018 Plan. 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 personal circumstances, 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 stock award or the disposition of stock acquired under the 2018 Plan. The 2018 Plan is not qualified under the provisions of Section 401(a) of the Code and is not subject to any of the provisions of the Employee Retirement Income Security Act of 1974. Our ability to realize the benefit of any tax deductions described below depends on our generation of taxable income as well as the requirement of reasonableness and the satisfaction of our tax reporting obligations.

Nonstatutory Stock Options

Generally, there is no taxation upon the grant of an NSO if the stock option is granted with an exercise price equal to the fair market value of the underlying stock on the grant date. Upon exercise, a participant will recognize ordinary income equal to the excess, if any, of the fair market value of the underlying stock on the date of exercise of the stock option over the exercise price. If the participant is employed by us or one of our

affiliates, that income will be subject to withholding taxes. The participant's tax basis in those shares will be equal to his or her fair market value on the date of exercise of the stock option, and the participant's capital gain holding period for those shares will begin on that date.

Subject to the requirement of reasonableness, the provisions of Section 162(m) of the Code ("Section 162(m)"), and the satisfaction of a tax reporting obligation, we will generally be entitled to a tax deduction equal to the taxable ordinary income realized by the participant.

Incentive Stock Options

The 2018 Plan provides for the grant of stock options that are intended to qualify as "incentive stock options," as defined in Section 422 of the Code. Under the Code, a participant generally is not subject to ordinary income tax upon the grant or exercise of an ISO. If the participant holds a share received upon exercise of an ISO for more than two years from the date the stock option was granted and more than one year from the date the stock option was exercised, which is referred to as the required holding period, the difference, if any, between the amount realized on a sale or other taxable disposition of that share and the participant's tax basis in that share will be long-term capital gain or loss.

If, however, a participant disposes of a share acquired upon exercise of an ISO before the end of the required holding period, which is referred to as a disqualifying disposition, the participant generally will recognize ordinary income in the year of the disqualifying disposition equal to the excess, if any, of the fair market value of the share on the date of exercise of the stock option over the exercise price. However, if the sales proceeds are less than the fair market value of the share on the date of exercise of the stock option, the amount of ordinary income recognized by the participant will not exceed the gain, if any, realized on the sale. If the amount realized on a disqualifying disposition exceeds the fair market value of the share on the date of exercise of the stock option, that excess will be short-term or long-term capital gain, depending on whether the holding period for the share exceeds one year.

For purposes of the alternative minimum tax, the amount by which the fair market value of a share of stock acquired upon exercise of an ISO exceeds the exercise price of the stock option generally will be an adjustment included in the participant's alternative minimum taxable income for the year in which the stock option is exercised. If, however, there is a disqualifying disposition of the share in the year in which the stock option is exercised, there will be no adjustment for alternative minimum tax purposes with respect to that share. In computing alternative minimum taxable income, the tax basis of a share acquired upon exercise of an ISO is increased by the amount of the adjustment taken into account with respect to that share for alternative minimum tax purposes in the year the stock option is exercised.

We are not allowed a tax deduction with respect to the grant or exercise of an ISO or the disposition of a share acquired upon exercise of an ISO after the required holding period. If there is a disqualifying disposition of a share, however, we will generally be entitled to a tax deduction equal to the taxable ordinary income realized by the participant, subject to the requirement of reasonableness, the provisions of Section 162(m), and provided that either the employee includes that amount in income or we timely satisfy our reporting requirements with respect to that amount.

Restricted Stock Awards

Generally, the recipient of a restricted stock award will recognize ordinary income at the time the stock is received equal to the excess, if any, of the fair market value of the stock received over any amount paid by the recipient in exchange for the stock. If, however, the stock is not vested when it is received (for example, if the employee is required to work for a period of time in order to have the right to sell the stock), the recipient generally will not recognize income until the stock becomes vested, at which time the recipient will recognize ordinary income equal to the excess, if any, of the fair market value of the stock on the date it becomes vested over any amount paid by the recipient in exchange for the stock. A recipient may, however, file an election with the Internal Revenue Service, within 30 days following his or her receipt of the restricted stock award, to recognize ordinary income, as of the date the recipient receives the restricted stock award, equal to the excess, if any, of the fair market value of the stock on the date the restricted stock award is granted over any amount paid by the recipient for the stock.

The recipient's basis for the determination of gain or loss upon the subsequent disposition of shares acquired from a restricted stock award will be the amount paid for such shares plus any ordinary income recognized either when the stock is received or when the stock becomes vested.

Subject to the requirement of reasonableness, the provisions of Section 162(m), and the satisfaction of a tax reporting obligation, we will generally be entitled to a tax deduction equal to the taxable ordinary income realized by the recipient of the restricted stock award.

Restricted Stock Unit Awards

Generally, the recipient of a restricted stock unit award structured to comply with the requirements of Section 409A of the Code or an exception to Section 409A of the Code will recognize ordinary income at the time the stock is delivered equal to the excess, if any, of the fair market value of the stock received over any amount paid by the recipient in exchange for the stock. To comply with the requirements of Section 409A of the Code, the stock subject to a restricted stock unit award may generally only be delivered upon one of the following events: a fixed calendar date (or dates), separation from service, death, disability or a change in control. If delivery occurs on another date, unless the restricted stock unit award otherwise complies with or qualifies for an exception to the requirements of Section 409A of the Code (including delivery upon achievement of a performance goal), in addition to the tax treatment described above, the recipient will owe an additional 20% federal tax and interest on any taxes owed.

The recipient's basis for the determination of gain or loss upon the subsequent disposition of shares acquired from a restricted stock unit award will be the amount paid for such shares plus any ordinary income recognized when the stock is delivered.

Subject to the requirement of reasonableness, the provisions of Section 162(m), and the satisfaction of a tax reporting obligation, we will generally be entitled to a tax deduction equal to the taxable ordinary income realized by the recipient of the restricted stock unit award.

Stock Appreciation Rights

Generally, if a stock appreciation right is granted with an exercise price equal to the fair market value of the underlying stock on the grant date, the recipient will recognize ordinary income equal to the fair market value of the stock or cash received upon such exercise. Subject to the requirement of reasonableness, the provisions of Section 162(m), and the satisfaction of a tax reporting obligation, we will generally be entitled to a tax deduction equal to the taxable ordinary income realized by the recipient of the stock appreciation right.

Plan Benefits Under the 2018 Plan

The following table sets forth certain information regarding future benefits under the 2018 Plan, as amended:

Name and Position	Number of Shares
John A. Scarlett, M.D. Chairman of the Board, President and Chief Executive Officer	(1)
Olivia K. Bloom Executive Vice President Finance, Chief Financial Officer and Treasurer	(1)
Andrew J. Grethlein, Ph.D. Executive Vice President, 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 who are not executive officers as a group	(1)

(1) Awards granted under the 2018 Plan to our executive officers and other employees are discretionary and are not subject to set benefits or amounts under the terms of the 2018 Plan, and we have not granted any awards under the 2018 Plan subject to stockholder approval of this Proposal 3. Accordingly, the future benefits or amounts that will be received by or allocated to our executive officers and other employees under the 2018 Plan are not determinable.

(2) As described above in this proxy statement under "Compensation of Directors," pursuant to the current Director Compensation Policy, the aggregate number of shares subject to such Annual Grants that will automatically be granted to all of our current non-employee directors as a group will be 875,000 shares each year.

2018 Plan Benefits

The following table presents certain information with respect to cumulative stock options that have been granted under the 2018 Plan as of March 1, 2023:

Name and Position	Cumulative Number of Shares Subject to Stock Options Granted Under the 2018 Plan	Weighted Average Exercise Price Per Share
John A. Scarlett, M.D. ..... Chairman of the Board, President and Chief Executive Officer	7,582,750	$ 1.69
Olivia K. Bloom ..... Executive Vice President, Finance, Chief Financial Officer and Treasurer	2,966,375	$ 1.69
Andrew J. Grethlein, Ph.D. ..... Executive Vice President, Chief Operating Officer	3,031,844	$ 1.78
All current executive officers as a group.....	16,876,769	$ 1.76
All current directors who are not executive officers as a group.....	2,886,000	$ 1.75
Each nominee for election as a director:		
V. Bryan Lawlis, Ph.D.....	431,000	$ 1.78
Susan M. Molineaux, Ph.D.....	431,000	$ 1.78
Each associate of any current executive officers, current directors or director nominees.....	—	$ —
Each other person who received or is to receive 5% of awards	—	$ —
All current employees who are not executive officers as a group.....	27,937,148	$ 1.80

Equity Compensation Plan Information

Please see the section of this Proxy Statement entitled “Equity Compensation Plan Information” for certain information with respect to compensation plans under which our equity securities are authorized for issuance.

Effectiveness of Plan Amendments

If this Proposal 3 is approved by our stockholders, each of the Fungible Share Amendment and the ISO Limit Amendment will become effective as of the date of the Annual Meeting. As described in Proposal 2, due to our current lack of sufficient unissued and unreserved shares of Common Stock, if Proposal 3 is approved by our stockholders, the 2018 Plan Share Increase will not become effective until the effectiveness of an amendment to our Restated Certificate of Incorporation to increase our authorized number of shares of Common Stock in at least an amount sufficient to cover the 2018 Plan Share Increase. Accordingly, even if this Proposal 3 is approved by our stockholders, if our stockholders do not also approve Proposal 2, then we would again need to seek the approval of our stockholders to amend the Restated Certificate of Incorporation to increase the number of authorized shares of our Common Stock and only after such approval is obtained and the related amendment to the Restated Certificate of Incorporation is effective, would the 2018 Plan Share Increase become effective. We may be unable to do so in a timely manner or at all, in which case, even if this Proposal 3 is approved by our stockholders, the effectiveness the 2018 Plan Share Increase may be substantially delayed or precluded altogether.

If this Proposal 3 is not approved by our stockholders, then each of the 2018 Plan Share Increase, the Fungible Share Amendment and the ISO Limit Amendment will not become effective and the 2018 Plan will continue to be effective in accordance with its terms.

Vote Required

Approval of this Proposal 3 requires the affirmative vote of the holders of a majority of the shares having voting power present in person or represented by proxy at the Annual Meeting. Abstentions will have the same effect as a vote against this proposal, and broker non-votes will have no effect on the outcome of this proposal.

The Board of Directors Unanimously Recommends That Stockholders Vote FOR Proposal 3

PROPOSAL 4

ADVISORY VOTE TO APPROVE THE FREQUENCY OF HOLDING FUTURE ADVISORY VOTES ON EXECUTIVE COMPENSATION

At the 2017 Annual Meeting of Stockholders, we requested that our stockholders indicate, on an advisory basis, the preferred frequency of the "say-on-pay" vote. In response to stockholders' preference for an annual vote, the Board approved a policy to hold a "say-on-pay" advisory vote every year.

Section 951 of the Dodd-Frank Wall Street Reform and Consumer Protection Act and Section 14A of the Exchange Act require a company to seek a non-binding, advisory vote on the frequency of the "say-on-pay" vote at least once every six years. Currently, consistent with the preference expressed by the stockholders at the Company's 2017 Annual Meeting of Stockholders, the policy of the Board is to solicit an advisory vote on executive compensation every year. Accordingly, the Board is again presenting stockholders the opportunity to vote on whether they would prefer an advisory vote on executive compensation once every one, two or three years. For the reasons described below, the Board recommends that the stockholders select a frequency of annually.

Advisory Vote and Board Recommendation

After careful consideration of the frequency alternatives, the Board continues to believe that conducting an advisory vote on executive compensation on an annual basis is appropriate for Geron and its stockholders, and is therefore recommending that stockholders vote every year as the preferred frequency for holding advisory votes on executive compensation. Stockholders are being asked to indicate their own choice among the frequency options. You may cast your vote on your preferred voting frequency by choosing the option of one year, two years, three years, or you may abstain from voting.

While the Board believes that its recommendation is appropriate at this time, our stockholders are not voting to approve or disapprove the Board's recommendation, but are instead being asked to indicate their own choice as to whether the advisory vote on executive compensation should be held every one, two or three years.

Vote Required

The option, if any, among those choices in this Proposal 4 that receives the votes of the holders of a majority of the shares having voting power present in person or represented by proxy at the Annual Meeting will be considered the frequency approved by our stockholders. Abstentions will be counted towards the vote total, but will not be counted as a vote in favor of any of the frequency options, and thus will have the effect of reducing the likelihood that any frequency option receives a majority vote. Broker non-votes will have no effect on this proposal.

The Board and the Compensation Committee value the opinions of the stockholders in this matter and, to the extent there is any significant vote in favor of one frequency over the other options, even if less than a majority, the Board will consider the stockholders' concerns and evaluate any appropriate next steps. However, because this vote is advisory and, therefore, not binding on the Board or Geron, the Board may decide that it is in the best interests of the stockholders that we hold an advisory vote on executive compensation more or less frequently than the option preferred by the stockholders. The vote will not be construed to create or imply any change or addition to the fiduciary duties of us or the Board.

The Board of Directors Unanimously Recommends That Stockholders Vote every "1 YEAR" for Proposal 4

PROPOSAL 5

ADVISORY VOTE TO APPROVE NAMED EXECUTIVE OFFICER COMPENSATION

As required by Section 951 of the Dodd-Frank Wall Street Reform and Consumer Protection Act and Section 14A of the Exchange Act, the Board is requesting stockholders to vote, on a non-binding advisory basis, to approve the compensation paid to Geron's Named Executive Officers (as defined under the section entitled, "Executive Compensation"), as disclosed in this Proxy Statement. This proposal, commonly known as a "say-on-pay" proposal, gives stockholders the opportunity to express their views on the compensation of Geron's Named Executive Officers.

This vote is not intended to address any specific item of compensation, but rather the overall compensation of our Named Executive Officers and our executive compensation philosophy, policies and practices described in this Proxy Statement. The overall compensation of our Named Executive Officers subject to the vote is disclosed in this Proxy Statement in the sub-sections entitled "Summary Compensation Table" and "Narrative Disclosure to Summary Compensation Table and Outstanding Equity Awards Table."

The Compensation Committee continually reviews our executive compensation program to determine whether such program achieves our desired goals of aligning our executive compensation strategy and structure with our stockholders' interests and current market practices. As discussed in detail in the section entitled "Executive Compensation" of this Proxy Statement, our executive compensation strategy and structure is designed to motivate our executive management team to create long-term value for our stockholders through the achievement of strategic business objectives, while effectively managing the risks and challenges inherent in a late-stage clinical and pre-commercial biopharmaceutical company. As the long-term success of Geron depends on the talents of our employees, our compensation structure plays a significant role in our ability to attract, retain and motivate the highest quality workforce in a competitive employment environment in both the San Francisco Bay Area and northern New Jersey, while also promoting a high-performance culture. The Compensation Committee believes the emphasis on pay for performance in our executive compensation program strongly aligns with the long-term interests of our stockholders. Please read the "Executive Compensation" section of this Proxy Statement for additional details about our executive compensation program, including information about the 2022 compensation of our Named Executive Officers.

Advisory Vote and Board Recommendation

We recommend stockholder approval of the compensation of our Named Executive Officers for the 2022 fiscal year as disclosed in this Proxy Statement pursuant to the SEC's compensation disclosure rules, which disclosure includes the section entitled "Executive Compensation," and the compensation tables and accompanying narrative disclosures in sub-sections entitled "Summary Compensation Table" and "Narrative Disclosure to Summary Compensation Table and Outstanding Equity Awards Table" of this Proxy Statement.

Accordingly, the Board recommends that stockholders vote in favor of the following resolution:

"RESOLVED, that the stockholders approve, on a non-binding advisory basis, the compensation paid to Geron's Named Executive Officers, as disclosed in the Executive Compensation section, the tabular disclosure regarding such compensation and the accompanying narrative disclosure set forth in the Proxy Statement relating to the Company's 2023 Annual Meeting of Stockholders."

Vote Required

Approval of this Proposal 5 requires the affirmative vote of the holders of a majority of the shares having voting power present in person or represented by proxy at the Annual Meeting. Abstentions will have the same effect as a vote against this proposal, and broker non-votes will have no effect on the outcome of this proposal.

As this is an advisory vote, the outcome of the vote is non-binding on us with respect to future executive compensation decisions, including those related to our Named Executive Officers, or otherwise. However, the Board and the Compensation Committee will review the results of the vote and take them into account when considering future executive compensation policies and decisions.

Unless the Board modifies its policy on the frequency of future advisory votes on the compensation of our Named Executive Officers, including in response to the outcome of the vote on Proposal 5, the next advisory vote on the compensation of our Named Executive Officers will be held at next year's annual meeting of stockholders.

The Board of Directors Unanimously Recommends That Stockholders Vote FOR Proposal 5

EXECUTIVE COMPENSATION

We are a "smaller reporting company" under Item 10 of Regulation S-K promulgated under the Exchange Act, and the following compensation disclosure is intended to comply with the requirements applicable to smaller reporting companies. Although the rules allow us to provide less detail about our executive compensation program, our Compensation Committee is committed to providing the information necessary to help stockholders understand our executive compensation-related decisions. Accordingly, this section includes supplemental narratives that describe the 2022 executive compensation program for our Named Executive Officers.

The following members of our executive management team are collectively referred to herein as our Named Executive Officers:

- Dr. John A. Scarlett, Chairman of the Board, President and Chief Executive Officer;
- Ms. Olivia K. Bloom, Executive Vice President, Finance, Chief Financial Officer and Treasurer; and
- Dr. Andrew J. Grethlein, Executive Vice President, Chief Operating Officer.

Summary Compensation Table

The following table includes information concerning compensation for the years ended December 31, 2022 and 2021 with respect to our Named Executive Officers.

Name and Principal Position	Year	Salary ($)	Bonus ($)	Option Awards ($)[1]	Non-Equity Incentive Plan Compensation ($)[2]	All Other Compensation ($)[3]	Total ($)
John A. Scarlett, M.D.	2022	761,320	—	1,468,740	671,000	96,142	2,997,202
Chairman of the Board, President and Chief Executive Officer	2021	735,575	—	796,740	441,300	83,372	2,056,987
Olivia K. Bloom	2022	507,546	—	524,550	302,500	15,978	1,350,574
Executive Vice President, Finance, Chief Financial Officer and Treasurer	2021	490,383	—	398,370	237,200	15,692	1,141,645
Andrew J. Grethlein, Ph.D.	2022	507,546	—	524,550	302,500	37,153	1,371,749
Executive Vice President, Chief Operating Officer	2021	490,383	—	398,370	240,500	36,395	1,165,648

(1) Amounts do not reflect dollar amounts actually received by our Named Executive Officer and instead, in accordance with SEC rules, represent the aggregate grant date fair value of stock option awards granted during the applicable fiscal year as calculated in accordance with FASB ASC Topic 718. Refer to Note 9 of the consolidated financial statements in our Annual Report on Form 10-K for the year ended December 31, 2022 regarding assumptions underlying the valuation of stock option awards and the calculation method.

(2) Amounts disclosed under the "Non-Equity Incentive Plan Compensation" column represent the portion of the annual performance-based bonuses earned pursuant to our annual performance-based bonus plan for the indicated year for the achievement of pre-established corporate and other goals. For further discussion on performance-based bonuses paid for 2022, see the sub-section entitled "2022 Annual Performance-Based Bonuses."

(3) Amounts shown include, as applicable: (i) reimbursements for housing, travel expenses and working from home reimbursements; (ii) the portion of life and health insurance premiums paid by the Company; and (iii) the matching contribution made to the Geron 401(k) Plan on behalf of each Named Executive Officer. Amounts for the 2022 fiscal year were as follows:

Named Executive Officer	Housing Allowance ($)	Commute Travel Reimbursement ($)	Insurance Premiums ($)	401(k) Match ($)[a]	Working from Home Reimbursement ($)	Total ($)
John A. Scarlett, M.D.	48,000	20,000	26,942	—	1,200	96,142
Olivia K. Bloom	—	—	1,878	13,500	600	15,978
Andrew J. Grethlein, Ph.D.	—	—	23,053	13,500	600	37,153

(a) Under Geron's 401(k) Plan, all participating employees may contribute up to the annual Internal Revenue Service contribution limit. In February 2022, the Compensation Committee approved a matching contribution equal to 50% of each employee's annual contributions during 2022. The matching contributions were paid in cash in January 2023.

Outstanding Equity Awards at Fiscal Year-End

The following table includes information with respect to all outstanding stock options held by our Named Executive Officers as of December 31, 2022:

	Option Awards						
Named Executive Officer	Grant Date		Number of Securities Underlying Unexercised Options Exercisable (#)	Number of Securities Underlying Unexercised Options Unexercisable (#)	Equity Incentive Plan Awards: Number of Securities Underlying Unexercised Unearned Options (#)	Option Exercise Price ($/Sh)	Option Expiration Date
John A. Scarlett, M.D.	02/13/13		1,340,000	—	—	1.500	02/13/23
	02/11/14		1,340,000	—	—	5.090	02/11/24
	03/13/15		600,000	—	—	4.340	03/13/25
	02/11/16		600,000	—	—	2.540	02/11/26
	02/09/17		1,050,000	—	—	2.150	02/09/27
	01/31/18		1,050,000	—	—	2.450	01/31/28
	11/07/18		—	—	500,000 (2)	1.720	11/06/28
	11/07/18		—	—	1,000,000 (3)	1.720	11/06/28
	01/30/19	(1)	1,028,125	21,875	—	1.030	01/29/29
	02/12/20	(1)	412,781	169,969	—	1.295	02/11/30
	02/02/21	(1)	275,000	325,000	—	2.055	02/01/31
	02/16/22	(1)	437,500	1,662,500		1.060	02/15/32
Olivia K. Bloom	02/12/13		400,000	—	—	1.510	02/12/23
	02/10/14		400,000	—	—	5.010	02/10/24
	03/13/15		210,000	—	—	4.340	03/13/25
	02/11/16		210,000	—	—	2.540	02/11/26
	02/09/17		300,000	—	—	2.150	02/09/27
	01/31/18	(1)	350,000	—	—	2.450	01/31/28
	11/07/18		—	—	250,000 (2)	1.720	11/06/28
	11/07/18		—	—	500,000 (3)	1.720	11/06/28
	01/30/19	(1)	293,750	6,250	—	1.030	01/29/29
	02/12/20	(1)	206,391	84,984	—	1.295	02/11/30
	02/02/21	(1)	137,500	162,500	—	2.055	02/01/31
	02/16/22	(1)	156,250	593,750		1.060	02/15/32
Andrew J. Grethlein, Ph.D.	02/12/13		150,000	—	—	1.510	02/12/23
	02/10/14		200,000	—	—	5.010	02/10/24
	03/13/15		105,000	—	—	4.340	03/13/25
	02/11/16		105,000	—	—	2.540	02/11/26
	02/09/17		161,471	—	—	2.150	02/09/27
	01/31/18	(1)	186,018	—	—	2.450	01/31/28
	11/07/18		—	—	221,544 (2)	1.720	11/06/28
	11/07/18		—	—	452,804 (3)	1.720	11/06/28
	01/30/19	(1)	230,339	5,782	—	1.030	01/29/29
	02/12/20	(1)	206,391	84,984	—	1.295	02/11/30
	02/02/21	(1)	137,500	162,500	—	2.055	02/01/31
	02/16/22	(1)	156,250	593,750		1.060	02/15/32

(1) Stock option vests in a series of 48 equal consecutive monthly installments commencing from the date of grant, provided the executive officer continues to provide services to the Company. In addition to the

specific vesting schedule for each stock option, each unvested stock option is subject to potential future vesting acceleration as described under the sub-section entitled "Severance and Change in Control Benefits" above.

(2) Stock option vests fully and becomes exercisable upon written certification by the Compensation Committee of the achievement of acceptance for review by the FDA of an NDA for the first imetelstat indication.

(3) Stock option vests fully and becomes exercisable upon written certification by the Compensation Committee of the achievement of regulatory approval by the FDA of an NDA for the first imetelstat indication.

Narrative Disclosure to Summary Compensation Table and Outstanding Equity Awards Table

Appointed by our Board, the members of our Compensation Committee are independent of our management and meet the Nasdaq listing standards for independence. The Compensation Committee acts on behalf of the Board to oversee the compensation policies and practices applicable to all of our employees, including our Named Executive Officers.

The three principal components of our executive compensation program for our Named Executive Officers in 2022 were base salary, annual performance-based (cash) bonus opportunity and equity compensation. In the table below, we describe each compensation component, when it is paid, how we determine the amount or size of each component, and why we pay each component.

	/---------Fixed Pay-------/	/----------Variable Pay (At Risk)----------/	
	Base Salary	**Performance-Based Bonus[1]**	**Stock Options**
Form	Cash	Cash	Equity
When paid/vested	Ongoing, twice monthly	Annual	Fully vested after 4-years of continuous service
How determined	• Competitive data • Scope of responsibilities • Work experience • Critical skills • Internal equity • Individual performance	• Target awards are set as a percent of salary based on competitive data • Award payouts are based on achievement of weighted corporate and individual goals • CEO bonus tied 100% to corporate goal achievement	• Based on competitive data and industry standards • Takes into consideration potential projected benefit upon stock price appreciation
Why paid	Provides competitive levels of fixed pay to attract and retain executives	Motivates attainment of critical near-term priorities by linking annual company and individual performance to an annual incentive	Promotes retention of key talent, aligns executive and stockholder interests and encourages employee ownership in Geron

(1) Defined as non-equity incentive plan compensation in the Summary Compensation Table.

We do not have any formal policies for allocating compensation among salary, performance bonus awards and equity grants, short-term and long-term compensation or among cash and non-cash compensation. Instead, our Compensation Committee uses its judgment to establish a total compensation program for each Named Executive Officer that is a mix of current, short-term and long-term incentive compensation, and cash and non-cash compensation, that it believes appropriate to achieve the goals of our executive compensation program and our corporate objectives. In line with our pay for performance philosophy, we structured a significant portion of our Named Executive Officers' 2022 compensation to be variable, at risk and tied directly to our measurable performance in the form of performance-based bonuses and equity incentives.

The Compensation Committee actively reviews and assesses our executive compensation program in light of the highly competitive employment environment in the San Francisco Bay Area and northern New Jersey, the challenges of recruiting, motivating and retaining our executive management team, including our Named Executive Officers, in an industry such as ours, which has much longer business cycles than other commercial industries, and evolving compensation governance and best practices. Since December 2011, the Compensation Committee has retained Radford as its independent compensation consultant due to its extensive analytical and compensation expertise in the biotechnology and pharmaceutical industry. Although we pay the costs of Radford's services, the Compensation Committee has the sole authority to engage and terminate Radford's

services, as well as to approve fees for Radford's services. Radford makes recommendations to the Compensation Committee, but it has no authority to make compensation decisions on behalf of the Compensation Committee or us. The Compensation Committee, at its discretion, may communicate and meet with Radford with no employees present. For the 2022 fiscal year, Radford conducted analyses and provided advice on, among other things, the appropriate peer group to reference in determining executive compensation, design and structure of executive compensation for our executive officers and non-employee director compensation in comparison to the peer group, emerging trends in the life sciences industry regarding executive compensation and share usage under our equity incentive plans in comparison to the peer group.

The peer group of companies used by the Compensation Committee in making 2022 compensation decisions was comprised of the following companies:

Alector Therapeutics	Eiger BioPharmaceuticals, Inc.	Rigel Pharmaceuticals, Inc.
Aprea Therapeutics, Inc.	GlycoMimetics, Inc.	Syndax Pharmaceuticals, Inc.
Ardelyx, Inc.	ImmunoGen, Inc.	TG Therapeutics, Inc.
ChemoCentryx, Inc.	Karyopharm Therapeutics, Inc.	Tricida, Inc.
CymaBay Therapeutics, Inc.	La Jolla Pharmaceutical Company	Voyager Therapeutics, Inc.
Cytokinetics, Incorporated	MEI Pharma, Inc.	Zogenix, Inc.
Eidos Therapeutics	Odonate Therapeutics, Inc.	

With the assistance of Radford, the Compensation Committee considered several factors in determining the companies to be included in the peer group for 2022 executive compensation decisions, including stage of development, market capitalization, number of employees, public status and length of time being public, primary location of operations and level of research and development expenditures and revenue. At the time the peer group was selected, the market capitalization for the companies ranged from $300 million to $2.5 billion with headcounts ranging from 40 to 200 employees, compared to Geron's market capitalization of $583 million and headcount of 58 employees.

Important Features of Our Executive Compensation Program

What We Do:		**What We Don't Do:**	
✓	Emphasize pay for performance using a mix of annual and long-term metrics	X	Approve automatic or guaranteed annual salary increases
✓	Conduct competitive review to ensure executive compensation is aligned to market	X	Permit automatic or guaranteed bonuses or long-term incentive awards
✓	Require a compensation recoupment (i.e., clawback) with respect to our executive management team	X	Provide for tax gross-ups
✓	Appoint only independent directors to the Compensation Committee	X	Reprice options without stockholder approval
✓	Engage an independent compensation consultant reporting directly to the Compensation Committee	X	Allow hedging or pledging of Company stock
✓	Annually assess risk in our compensation programs and identify mitigation strategies	X	Grant stock options with an exercise price less than fair market value
✓	Conduct annual say-on-pay vote		

Pay for Performance/At-Risk Pay

Our executive compensation program is designed to reward achievement of the specific strategic goals that we believe will advance our business strategy and create long-term value for our stockholders. Consistent with our goal of attracting, motivating and retaining a high-caliber executive team, our executive compensation program is designed to pay for performance. We utilize compensation elements that meaningfully align our Named Executive Officers' interests with those of our stockholders to create long-term value. As such, a significant portion of our Chief Executive Officer's and other executive officers' compensation is "at-risk", performance-based compensation, in the form of long-term equity awards (including, from time to time, performance-vesting equity awards) and annual cash incentives that are only earned if we achieve measurable corporate metrics.

2022 Base Salaries

The Compensation Committee believes base salaries should be consistent with the base salaries provided by companies in our peer group. In February 2022, the Compensation Committee performed its annual analysis of base salaries for our executive management team, including our Named Executive Officers, using the peer group market data provided by Radford. The market data analysis showed that at the end of 2021, the base salary of all of our Named Executive Officers was at the 75th percentile of the peer group market data provided by Radford. Given the collaborative team-oriented effort required to achieve our corporate goals; the broad job responsibilities of our Named Executive Officers; the tenure, experience, skills and responsibilities of each Named Executive Officer; the desire for internal pay equity amongst the executive management team; to remain competitive in the marketplace; and based on guidance provided by Radford, the Compensation Committee and, with respect to Dr. Scarlett, the independent members of the Board (the "Independent Board"), approved an overall increase of 3.5% to 2021 base salaries, reflecting a market competitive merit increase and a cost of living adjustment.

The following base salaries for our Named Executive Officers were effective as of January 1, 2022.

Named Executive Officer	2021 Base Salary	Salary Increase (%)	2022 Base Salary
John A. Scarlett, M.D.	$ 735,575	3.5%	$ 761,320
Olivia K. Bloom	$ 490,383	3.5%	$ 507,546
Andrew J. Grethlein, Ph.D.	$ 490,383	3.5%	$ 507,546

2022 Annual Performance-Based Bonuses

In keeping with our pay for performance philosophy, the annual performance-based bonus that can be earned by each Named Executive Officer is variable and at risk due to its dependency on the performance of the individual and the overall Company. Consistent with prior years, for 2022, other than Dr. Scarlett, each Named Executive Officer's annual performance-based bonus was contingent on the following: 50% upon the level of achievement of our corporate goals, 30% upon the level of achievement of individual goals, and 20% upon individual support and manifestation of our corporate values. Consistent with prior years, Dr. Scarlett's annual performance-based bonus was 100% contingent upon the level of achievement of our corporate goals.

At the beginning of each calendar year, the Chief Executive Officer develops, with input from our Named Executive Officers, our annual corporate goals, including recommended weightings for each goal. The weighting for each corporate goal depends on its importance and business value for Geron and our stockholders. In addition, each goal is established with criteria to measure target goal accomplishment (100%), as well as criteria to measure stretch goal accomplishment (up to an additional 50% in the aggregate in certain cases). The Chief Executive Officer submits the corporate goals and recommended weightings to the Compensation Committee and the Independent Board for their review and approval. The Compensation Committee and Independent Board review the corporate goals and weightings and modify them as they deem appropriate prior to approval.

During the first quarter of the year, the Compensation Committee assesses the extent to which each annual corporate goal has been attained with the aggregate achievement defined as the corporate goal achievement factor. The Compensation Committee does not use a rigid formula to determine the corporate goal achievement factor, and to date, has not established a minimum threshold or maximum value that may be potentially realized for the corporate goal achievement factor. Also, the Compensation Committee can take into account additional achievements by the Company not originally set forth in the annual corporate goals. The corporate goal achievement factor can range from 0% to 150%. The Compensation Committee evaluates the corporate goal achievement factor, and recommends the corporate goal achievement factor to the Independent Board, who has the final approval.

2022 Corporate Goal Achievement Factor

The table below summarizes the corporate goals approved by the Independent Board for 2022, including assigned weightings, and the Compensation Committee's and Independent Board's assessments of the level of achievement of those goals. In furtherance of our commitment to extend and enhance the lives of patients by altering the underlying drivers of disease, our corporate goals in 2022 primarily focused on furthering the late-stage development of imetelstat, as well as exploring additional hematologic malignancies and combination regimens to maximize clinical and commercial value of the drug. In addition, corporate goals in 2022 aimed at

priming the organization for potential commercialization of imetelstat in the United States, or U.S. Following are the primary areas covered by our 2022 corporate goals.

- Delivering top-line results from IMerge Phase 3, the Phase 3 clinical trial of imetelstat in patients with lower risk MDS, to enable release of data in early January 2023;
- Attaining certain enrollment goals for IMpactMF, the Phase 3 clinical trial of imetelstat in patients with relapsed/refractory MF;
- Initiating IMproveMF, a two-part Phase 1 clinical trial evaluating imetelstat in combination with ruxolitinib in patients with frontline MF;
- Operationalizing plans, along with initial execution, to facilitate timely regulatory submissions in the U.S. and Europe and potential commercial launch of imetelstat in lower risk MDS in the U.S.; and
- Securing funding to support these goals.

In addition, stretch goals were included in 2022 to incentivize and motivate accelerated achievement of certain goals. Recognition of stretch achievements ties executive compensation to Company performance, consistent with our pay for performance compensation philosophy. Due to the timing of top-line results from IMerge Phase 3 occurring at the beginning of January 2023, the Compensation Committee recommended and the Independent Board approved an overarching factor to be applied against any achievement of corporate goals for 2022. Such factor would decrease the overall 2022 corporate goal achievement by 50% if top-line results from IMerge Phase 3 were negative and increase the overall 2022 corporate goal achievement by 25% if top-line results were positive. Based on the achievements noted below, including the reporting of positive top-line results from IMerge Phase 3 in January 2023, the Independent Board determined the overall 2022 corporate goal achievement factor to be 146.9%.

2022 Corporate Goals	Weighting	Highlights of Company Performance	Achieved?	Total
Deliver top-line results from IMerge Phase 3 to enable timely reporting in early January 2023.	20%	• Completed data cleaning and database lock on schedule to permit timely and comprehensive analysis of efficacy and safety data from IMerge Phase 3. • Reported positive top-line results from IMerge Phase 3 on January 4, 2023.	Yes	20%
Achieve certain enrollment target for IMpactMF to advance progress of the trial.	15%	• Reached designated enrollment target by December 31, 2022. • Initiated enrollment boosting strategies, including patient matching and increased clinical site visits.	Yes	15%
Initiate IMproveMF to explore combination treatment using imetelstat in an earlier myelofibrosis disease setting.	2.5%	• Two of three U.S. clinical sites opened for patient enrollment as of December 31, 2022. • First patient dosed in IMproveMF in August 2022.	Yes	2.5%
Complete preparedness activities related to U.S. and European regulatory submissions and potential U.S. commercial launch to facilitate timely actions upon positive top-line results from IMerge Phase 3.	40%	• >50% of sections of NDA and MAA submissions drafted. • Hired senior leadership for core commercial functions, including in Market Access, Trade & Channel Relations, Commercial Operations, Analytics, Marketing, Sales and Medical Affairs. • Hired and deployed medical science liaisons for medical affairs function to enhance and expand interactions with key opinion leaders (KOLs), clinical investigators and physicians. • Selected vendors for third party logistics and U.S. early access program. • Executed initial supply agreements with contract manufacturers for commercial inventory of imetelstat.	Yes	40%
Obtain at least $50 million in funding to support the potential commercialization of imetelstat broadly and on a timely basis.	10%	• Completed underwritten public offering in April 2022 for $75 million in gross proceeds.	Yes	10%

2022 Corporate Goals	Weighting	Highlights of Company Performance	Achieved?	Total
Seek and establish business development relationships for potential future partnerships.	7.5%	• Conducted over 35 meetings with regional and global pharmaceutical companies.	Yes	7.5%
Enhance talent attraction, employee engagement and leadership development through organizational training, education and communication programs.	5%	• Implemented mid-year employee engagement survey; enhanced recruiting and onboarding capabilities and supported targeted employee education and leadership development.	Yes	5%
Total 2022 Corporate Goals Achieved				**100%**

2022 Stretch Goals	Weighting	Highlights of Company Performance	Achieved?	Total
Exceed certain enrollment target for IMpactMF.	+10%	• Higher enrollment target not reached.	No	0%
Advance exploratory research and development programs for additional hematologic malignancy indications and telomerase inhibitor compounds.	+7.5%	• Initial results from preclinical research experiments at MD Anderson Cancer Center in lymphoid malignancies reported in November 2022. • Supported protocol development for IMpress, an investigator-led study of imetelstat in patients with higher risk MDS and relapsed/refractory acute myeloid leukemia.	Partial	+5%
Settle terms for a potential business development transaction.	20%	• No transaction contemplated.	No	0%
Obtain >$75 million in new funding.	+12.5%	• Completed underwritten public offering in April 2022 for $75 million in gross proceeds. • Expanded debt facility by $50 million.	Yes	+12.5%
Total 2022 Stretch Goals Achieved				**+17.5%**
Positive Top-Line Results Factor				**+25%**
Total Corporate Goal Achievement Factor		Potential: Up to 187.5% with positive top-line results factor		**Actual: 146.9%**

As summarized above, the Independent Board determined that the Company achieved 100% of the annual corporate goals and 17.5% of the stretch goals, for an aggregate achievement of 117.5%. Because of positive top-line results reported in early January 2023, an additional 25% factor was applied to the aggregate, resulting in an overall corporate goal achievement factor of 146.9% for 2022.

Following are the annual performance-based bonus targets and weighting percentages for each of the factors used to calculate the 2022 annual performance-based bonus for each of our Named Executive Officers, as well as the 2022 actual bonus percentage awarded.

Named Executive Officer	(A) Annual Incentive Bonus Target as a % of Salary	(B) Corporate Goal Achievement Weighting	(C) 2022 Corporate Goal Achievement Factor	(D) Individual Performance Weighting	(E) 2022 Individual Performance Factor	(F) Corporate Values Weighting	(G) 2022 Corporate Values Performance Factor	= (A*B*C) + (A*D*E) + (A*F*G) Annual Incentive Bonus Awarded as a % of Salary
John A. Scarlett, M.D.	60%	100%	146.9%	N/A	N/A	N/A	N/A	88.1%
Olivia K. Bloom.....	45%	50%	146.9%	30%	1.3	20%	1.0	59.6%
Andrew J. Grethlein, Ph.D. ..	45%	50%	146.9%	30%	1.3	20%	1.0	59.6%

Consistent with prior years, Dr. Scarlett's 2022 annual performance-based bonus was tied 100% to the corporate goal achievement factor. Accordingly, with the Independent Board approval of the corporate goal achievement factor of 146.9% and Dr. Scarlett's direct responsibility and contributions for the achievement of such goals, the Compensation Committee recommended, and the Independent Board approved, that Dr. Scarlett receive 146.9% of his 2022 target annual performance-based bonus.

Ms. Bloom was awarded an individual performance factor of 1.3 and a corporate values performance factor of 1.0 based on the achievements and contributions made by Ms. Bloom during 2022, including, in particular:

- managed and coordinated a raise of $75 million in gross proceeds through an underwritten public offering;
- negotiated expansion of debt facility from $75 million to $125 million for additional committed funding upon achievement of certain clinical and regulatory milestones and satisfaction of certain capitalization and other requirements for existing capital resources;
- renewed corporate and imetelstat product messaging to raise awareness amongst various audiences and arranged new and frequent interactions with investors and investment banking groups to convey new messaging;
- directed and oversaw evolution of financial transaction processes, practices and policies to handle anticipated growth in complexity and volume;
- assured compliance with SEC standards;
- handled all financial-related interface with the Board;
- served significant role in drafting and finalizing all external disclosure documents, including press releases, conference call scripts, securities filings, website updates and corporate presentations;
- developed and executed a comprehensive corporate communications plan, including timing and content in connection with reporting top-line results from IMerge Phase 3 in early January 2023; and
- managed Audit Committee matters, including creation and distribution of meeting materials to facilitate efficient and effective meetings.

Dr. Grethlein was awarded an individual performance factor of 1.3 and a corporate values performance factor of 1.0 based on the achievements and contributions made by Dr. Grethlein during 2022, including, in particular:

- served key leadership role in manufacturing and quality functions, enabling successful implementation of commercial-grade good manufacturing practices and processes, as well as integration of those procedures into overall technical operations;
- successful operational integration of the safety/pharmacovigilance function with the corresponding clinical and regulatory groups, and revitalization of the safety/pharmacovigilance leadership;
- established a maturing and highly functional human resources department designed to support a high-growth organization and our widely-dispersed workforce, as well as enhancements to professional education and leadership development programs to deepen employee value proposition for retention;
- continued development and oversight of global regulatory affairs function toward achievement of critical compliance milestones, including providing timely and comprehensive responses to regulatory inquiries and attaining agreement from regulatory authorities on protocol changes and ancillary study plans supporting NDA requirements;
- directed and championed next generation telomerase inhibitor program;
- provided strong executive leadership and support for information technology department encountering exponential increase in operational, system and hardware needs, including handling cybersecurity and supporting integration of new commercial systems; and
- assumed leadership and responsibility for ensuring efficient decision-making by executive management team members, including maintaining accountability for deadlines and commitments, as well as alignment and consistency in internal communications.

2022 Other Compensation

In accordance with his employment agreement, Dr. Scarlett is eligible to receive reimbursement for up to $4,000 per month in housing expenses and up to $20,000 for travel costs incurred over the course of the year, in connection with the commute from his personal residence in Texas to our headquarters in Foster City, California in 2022. These commuting expense benefits were negotiated with Dr. Scarlett at the time of his initial employment and were deemed a reasonable expense and necessary inducement to his commencement of employment with us. Dr. Scarlett does not receive separate compensation for serving as a member of our Board.

Geron offers a comprehensive array of benefits to its employees, including our Named Executive Officers. These include:

- comprehensive medical, dental, vision coverage and life insurance;
- a "cafeteria" plan administered pursuant to Section 125 of the Code, which includes Geron's medical and dental insurance, medical reimbursement, and dependent care reimbursement plans;
- monthly stipend to reimburse for expenses associated with remote working;
- annual reimbursement allowance for health and wellness expenses;
- a 401(k) plan, which is a retirement savings defined contribution plan established in accordance with Section 401(a) of the Code (in 2022, we provided a fully vested employer matching contribution in cash equal to 50% of each employee's annual contributions); and
- an Employee Stock Purchase Plan, which is implemented and administered pursuant to Section 423 of the Code.

Executive officers pay for 20% of their health premium cost, which is deducted from their gross salary. Other employees pay either 10% or 15% of their health premium cost. We do not offer any defined benefit pension plans or health benefits during retirement.

2022 Stock Option Grants

Consistent with the objectives of our executive compensation program to link pay with performance, align the interests of stockholders and employees, and encourage employee ownership in Geron, in February 2022, the Compensation Committee (or the Independent Board with respect to our Chief Executive Officer, upon recommendation from the Compensation Committee) approved stock option grants to our Named Executive Officers. The Compensation Committee (or the Independent Board with respect to our Chief Executive Officer, upon recommendation from the Compensation Committee), in consultation with Radford, determines the size of any stock option grant to members of our executive management team, including our Named Executive Officers, according to each individual's role in the Company. There is no set formula for the granting of stock options to employees, including our Named Executive Officers; however, the Compensation Committee references the grant ranges based on the market data provided by Radford for each position, as well as a Named Executive Officer's recent performance history and his or her potential for future responsibility; criticality of the individual to the long-term success of the Company; internal pay equity amongst the Named Executive Officers; and the amount of actual versus theoretical equity value per year that has been derived to date by the individual.

The Compensation Committee (and the Independent Board with respect to the Chief Executive Officer, upon recommendation from the Compensation Committee) also determined that the equity awards granted to our Named Executive Officers in 2022 should continue to consist only of stock options, rather than restricted stock awards or other full value awards, because stock options deliver future value only if the price per share of our Common Stock increases above the exercise price, thus aligning the interests of our Named Executive Officers and stockholders for the long-term success of Geron. In accordance with Geron's equity grant practices, the exercise price for the February 2022 stock option grants was equal to the closing price of our Common Stock reported by the Nasdaq Global Select Market on the date of grant and the vesting schedule is monthly over four years from the date of grant, provided the Named Executive Officer continues to provide services to Geron.

Our Named Executive Officers received the following stock option grants in February 2022:

Named Executive Officer	February 2022 Stock Option Grant (# of shares)
John A. Scarlett, M.D.	2,100,000
Olivia K. Bloom	750,000
Andrew J. Grethlein, Ph.D.	750,000

Employment Agreements with Named Executive Officers

We have entered into written employment agreements with each member of our executive management team, including our Named Executive Officers, that set forth the terms of their employment, including initial base salaries, and eligibility to participate in the Company's annual performance-based bonus program. In addition, each employment agreement includes restrictive covenants, such as non-compete and non-solicitation provisions, that would apply in the event of termination, which our Board believes helps protect the value invested by the Company in its personnel and operations. Each member of our executive management team, including our Named Executive Officers, is employed "at will."

Employment Agreement with Dr. Scarlett

We entered into an employment agreement with Dr. Scarlett dated September 29, 2011, in connection with the commencement of his employment with us. Dr. Scarlett's employment agreement originally provided him with an annual base salary of $550,000, subject to increase, and an annual performance-based bonus targeted at 60% of his annual base salary. On February 11, 2014, we amended Dr. Scarlett's employment agreement to provide for an annual base salary of $586,500, subject to increase, and to include a clawback provision. On January 31, 2018, we further amended Dr. Scarlett's employment agreement to increase the reimbursement for housing expenses to not more than $4,000 per month. See the sub-section entitled "2022 Other Compensation" for more information on the reimbursement arrangements we provide to Dr. Scarlett for housing expenses and travel costs. On January 31, 2019, we amended and restated Dr. Scarlett's employment agreement to (a) consolidate all of the previous amendments; (b) provide for an annual base salary of $690,000, subject to increase; and (c) clarify that in the event of a covered termination or change in control transaction, Dr. Scarlett will receive the greater of the severance benefits set forth in his employment agreement or the severance benefits provided for in the Company's Amended Severance Plan (without duplication), as defined below. See the sub-section entitled "Severance and Change in Control Benefits" for further information.

Employment Agreement with Ms. Bloom

We entered into an employment agreement with Ms. Bloom dated December 7, 2012, in connection with her appointment as our Senior Vice President, Finance, Chief Financial Officer and Treasurer, to provide an annual base salary of $330,000 and an annual performance-based bonus targeted at 40% of her annual base salary. On September 24, 2013, we amended Ms. Bloom's employment agreement to include a clawback provision. On February 11, 2014, in connection with her promotion to Executive Vice President, we amended Ms. Bloom's employment agreement to provide for an annual base salary of $365,000, subject to increase, and an annual performance-based bonus targeted at 45% of her annual base salary. On January 31, 2019, we amended and restated Ms. Bloom's employment agreement to (a) consolidate all of the previous amendments; (b) provide for an annual base salary of $460,000, subject to increase; and (c) clarify that in the event of a covered termination or change in control transaction, Ms. Bloom will receive the greater of the severance benefits set forth in her employment agreement or the severance benefits provided for in the Company's Amended Severance Plan (without duplication), as defined below. See the sub-section entitled "Severance and Change in Control Benefits" for further information.

Employment Agreement with Dr. Grethlein

We entered into an employment agreement with Dr. Grethlein effective September 17, 2012, in connection with commencement of his employment with us, to provide an annual base salary of $355,000 and an annual performance-based bonus targeted at 45% of his annual base salary. On February 11, 2014, we amended Dr. Grethlein's employment agreement to provide for an annual base salary of $379,000, subject to increase, and to include a clawback provision. On January 31, 2019, we amended and restated Dr. Grethlein's employment agreement to (a) consolidate all of the previous amendments; (b) incorporate his new title of Chief Operating Officer; (c) provide for an annual base salary of $460,000, subject to increase; and (d) clarify that in the event of a covered termination or change in control transaction, Dr. Grethlein will receive the greater of the severance benefits set forth in his employment agreement or the severance benefits provided for in the

Company's Amended Severance Plan (without duplication), as defined below. See the sub-section entitled "Severance and Change in Control Benefits" for further information.

Severance and Change in Control Benefits

Our executive management team, including our Named Executive Officers, is entitled to certain severance and change in control benefits under the terms of our Amended Severance Plan, as defined below, their employment agreements and our equity plans. Given the nature of the life sciences industry and the range of strategic initiatives we may explore, the Compensation Committee believes that these severance and change in control provisions are essential elements of our executive compensation program and assist us in recruiting, retaining and developing key management talent in the competitive San Francisco Bay Area and northern New Jersey employment markets. Our change in control benefits are intended to allow employees, including our Named Executive Officers, to focus their attention on the business operations of the Company in the face of the potentially disruptive impact of a rumored or actual change in control transaction, to assess takeover bids objectively without regard to the potential impact on their own job security and to allow for a smooth transition in the event of a change in control of the Company. In addition, our severance benefits provide reasonable protection to our executive management team, including our Named Executive Officers, in the event that they are not retained. We do not provide for any excise tax gross-ups in the Amended Severance Plan or in any individual employment agreement with any member of our executive management team, including our Named Executive Officers.

Employment Agreements

Our executive management team, including our Named Executive Officers, is entitled to certain severance benefits payable in connection with a Covered Termination (as defined below) under their employment agreements. Pursuant to these employment agreements, in the event of a Covered Termination and subject to a release of claims against Geron, each Named Executive Officer will be entitled to (i) a lump-sum severance payment equal to 12 months (24 months, with respect to Dr. Scarlett) of his or her base salary in effect as of such termination, (ii) a lump-sum payment equal to the pro-rated portion of any target annual performance-based bonus (except for Dr. Scarlett, who will receive a lump-sum equal to any annual bonus for any fiscal year that ends on or before the termination date that he would have received had he remained employed through the payment date), and (iii) continued COBRA coverage for a period of one year following a Covered Termination. In addition, the vested portion of any stock options, or other exercisable equity award in Geron, will remain exercisable until the earlier of the second anniversary of the date of termination and the original expiration date of such award.

For the purposes of our Named Executive Officers' employment agreements, the following definitions apply:

- "Covered Termination" generally means an Involuntary Termination Without Cause that occurs at any time, provided that such termination constitutes a "separation from service" within the meaning of Section 409A of the Code.
- "Involuntary Termination Without Cause" generally means an executive officer's dismissal or discharge other than: a) for Cause or b) following an involuntary or voluntary filing of bankruptcy, an assignment for the benefit of creditors, a liquidation of our assets in a formal proceeding or otherwise or any other event of insolvency by Geron, in any case, without an offer of comparable employment by Geron or a successor, acquirer, or affiliate of Geron.
- "Cause" generally means the executive officer's:
  - (i) willful act or omission constituting dishonesty, fraud or other malfeasance against the Company;
  - (ii) conviction of a felony;
  - (iii) debarment by the FDA from working in or providing services to any pharmaceutical or biotechnology company or other ineligibility under any law or regulation to perform the employee's duties to the Company; or
  - (iv) breach of any material Company policies.

Amended Severance Plan

In September 2002, the Board approved a Severance Plan that became effective on January 21, 2003 and was subsequently amended and restated in May 2013, January 2019 and January 2022 (collectively referred to herein as the "Amended Severance Plan"). The Amended Severance Plan applies to (i) eligible employees of the Company who were hired by the Company on or before December 31, 2021 and (ii) certain designated key employees of the Company, including our Named Executive Officers, who are not subject to a performance improvement plan. The Board also approved a new severance plan, referred to herein as the "2022 Severance Plan," effective January 1, 2022, which applies to employees hired by the Company on or after January 1, 2022 at the Vice President level or below, who are not subject to a performance improvement plan. As such, our executive management team, including our Named Executive Officers, does not have any benefits under the 2022 Severance Plan.

The Amended Severance Plan provides for cash severance benefits to be paid to employees, including our Named Executive Officers, under a "double trigger" situation, defined below as a Change in Control Triggering Event. Under this double trigger requirement, severance benefits are paid only upon the occurrence of a Change in Control and a termination of employment, with such termination being either by the Company or because the employee resigns due to a material change in their employment terms. The Board believes that a double trigger requirement is industry standard and provides appropriate protection for our employees, including our Named Executive Officers, from post-Change in Control events that are not related to the employee's performance, encourages employees to stay throughout a transition period in the event of a Change in Control and does not provide for benefits for an employee who remains with the surviving company in a comparable position. Under the Amended Severance Plan, the following definitions apply:

- "Change in Control Triggering Event" is defined as a termination without Cause in connection with a Change in Control (which has the same definition as under the 2018 Plan) or within 12 months following a Change in Control. Additionally, if an individual is terminated by the Company in connection with a Change in Control but immediately accepts employment with the Company's successor or acquirer, they will not be deemed to have had a Change in Control Triggering Event unless:
  - (i) such individual is subsequently terminated without Cause by the successor or acquirer within the 12 months following the Change in Control;
  - (ii) such individual resigns employment with the Company because in connection with a Change in Control they are offered terms of employment (new or continuing) by the Company or the Company's successor or acquirer within 30 days after the Change in Control that results in a material change in the terms of employment; or
  - (iii) after accepting (or continuing) employment with the Company or the Company's successor or acquirer after a Change in Control, such individual resigns employment within 12 months following the Change in Control due to a material change in terms of employment as defined below.
- "Cause" generally means an employee's continued failure to satisfactorily perform duties, willful act or omission constituting dishonesty, fraud or other malfeasance against the Company, conviction of a felony, debarment by the FDA from working in or providing services to any pharmaceutical or biotechnology company or other ineligibility under any law or regulation to perform the employee's duties to the Company, or breach of any material Company policies.
- "Material change in terms of employment" shall occur if one of the following events occurs without the employee's consent:
  - (i) base salary is materially reduced from that in effect immediately prior to the Change in Control;
  - (ii) if at the time of the Change in Control they are employed at the director level or above, they are subject to a material reduction in their duties (including responsibilities and/or authority);
  - (iii) their principal work location is to be moved to a location that is either more than 45 miles from their principal work location immediately prior to the Change in Control or more than 30 miles farther from their principal weekday residence than was their principal work location immediately prior to the Change in Control; or

(iv) the Company or the Company's successor or acquirer materially breaches the terms of any employment or similar service agreement with the employee.

Additionally, in order for the resignation to be deemed due to a material change in terms of their employment, the employee must provide written notice to the Company's Chief Legal Officer within 30 days after the first occurrence of the event giving rise to a material change in their terms of employment setting forth the basis for their resignation, allow the Company at least 30 days from receipt of such written notice to cure such event, and if such event is not reasonably cured within such period, the employee's resignation from all positions they then hold with the Company is effective not later than 90 days after the expiration of the cure period.

Upon a Change in Control Triggering Event, each of our Named Executive Officers is entitled to: (i) a severance payment equal to 15 months (18 months, with respect to Dr. Scarlett) of his or her base salary then in effect as of such Change in Control Triggering Event; (ii) payment of his or her target annual bonus, at the target bonus percentage in effect immediately prior to his or her separation from service, prorated for the length of service provided in the termination year; and (iii) payment of COBRA premiums for up to 15 months (18 months, with respect to Dr. Scarlett). These benefits are consistent with severance plans offered at companies similar in size in our industry and competitive market environment. Payment of any severance benefits under the Amended Severance Plan is conditioned on the timely provision of an effective release of claims against Geron. If a Named Executive Officer is entitled to severance benefits upon a termination of employment under both the Amended Severance Plan and an employment agreement, the Named Executive Officer will receive the greater of such severance benefits (without duplication). The benefits provided under the Amended Severance Plan are not intended to be duplicative of those provided in any employment agreement.

Equity Plans

As set forth in each individual stock option agreement under the 2018 Plan and the Inducement Plan, in the event of a Change in Control of Geron (defined below), the vesting of each outstanding stock option held by all employees and non-employee directors will accelerate so that each stock option shall become fully exercisable for all of the outstanding shares subject to such stock option immediately prior to the consummation of such transaction and each other type of award shall be fully vested with all forfeiture restrictions on any or all of such awards to lapse. For purposes of the 2018 Plan and Inducement Plan, a "Change in Control" generally means and includes each of the following:

a) as a result of any merger or consolidation, the voting securities of Geron outstanding immediately prior thereto represent (either by remaining outstanding or by being converted into voting securities of the surviving or acquiring entity) less than 49% of the combined voting power of the voting securities of Geron or such surviving or acquiring entity outstanding immediately after such merger or consolidation; during any period of 24 consecutive calendar months, the individuals who at the beginning of such period constitute the board of directors, and any new directors whose election by such board of directors or nomination for election by stockholders was approved by a vote of at least two-thirds of the members of such board of directors who were either directors on such board of directors at the beginning of the period or whose election or nomination for election as directors was previously so approved, for any reason cease to constitute at least a majority of the members thereof;

b) any individual, entity or group becomes the beneficial owner of more than 20% of the then outstanding shares of our Common Stock;

c) any sale of all or substantially all of the assets of Geron; or

d) the complete liquidation or dissolution of Geron.

In the event an employee or non-employee director experiences a termination of service as a result of the employee's or non-employee director's total and permanent disability (as defined in Section 22(e)(3) of the Code) or death, the 2018 Plan and Inducement Plan provides through each respective plan or the individual stock option agreement, that the portion of each outstanding stock option with time-based vesting held by such employee or non-employee director that would have vested during the 36 months after the date of termination of service will automatically vest. The stock options that were already vested upon the date of termination and those that automatically vested in connection with an employee's total and permanent disability or death will remain exercisable until the earlier of the second anniversary of the date of termination and the original expiration date of such stock option. For a non-employee director, the post-termination exercise period is the earlier of the third anniversary of the date of termination and the original expiration date of such stock option.

In the event an employee experiences a termination of service as a result of the employee's total and permanent disability (as defined in Section 22(e)(3) of the Code) or death, the individual stock option agreement for stock options with performance-based vesting permits the unvested portion of such stock option to continue to be eligible to vest and become exercisable upon the achievement of the performance goal set forth in the stock option grant notice to the extent such performance goal has not already been achieved as of the date of the employee's total and permanent disability or death, if and only if the performance goal occurs within the 36 months following the date of the employee's total and permanent disability or death, however, not beyond the original term of the stock option.

Pay Versus Performance Table

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 and certain financial performance of the Company. For information on our executive compensation program and the Compensation Committee's approach, refer to the above Narrative Disclosure to Summary Compensation Table and Outstanding Equity Awards Table.

Year[1]	Summary Compensation Table Total for PEO[2]	Compensation Actually Paid to PEO[3]	Average Summary Compensation Table Total for Non-PEO NEOs[4]	Average Compensation Actually Paid to Non-PEO NEOs[5]	Value of Initial Fixed $100 Investment Based On Total Shareholder Return[6]	Net Income (Loss) (In Thousands)[7]
2022	$2,997,203	$5,898,457	$1,361,162	$2,480,002	152.20	($141,901)
2021	$2,056,987	$1,340,341	$1,155,449	$832,837	76.73	($116,112)

(1) For each of the two years presented in the above table, John Scarlett was our Principal Executive Officer ("PEO") and our Non-PEO Named Executive Officers ("Non-PEO NEOs") were Olivia Bloom and Andrew Grethlein.

(2) See the Summary Compensation Table above for detail on the Summary Compensation Table total compensation for our PEO for each fiscal year covered in the table. The average compensation for the Non-PEO NEOs for 2022 was calculated using the Summary Compensation Table above. The average compensation for the Non-PEO NEOs for 2021 was calculated using the Summary Compensation Table as disclosed in our proxy statement filed with the Securities and Exchange Commission in calendar year 2022.

(3) For purposes of this table, the compensation actually paid ("Compensation Actually Paid", or "CAP") has been computed in accordance with Item 402(v) of Regulation S-K under the Exchange Act and do not reflect the actual amount of compensation earned by or paid to the NEOs during the applicable year. These amounts reflect total compensation as reflected in the above Summary Compensation Table for the applicable year less the grant date fair values of stock option awards included in the "Option Awards" column of the Summary Compensation Table for the Named Executive Officer for the applicable year, and adjusted as follows for each stock option award granted to each Named Executive Officer:

Year	Reported Summary Compensation Table Total for PEO	Reported Value of Equity Awards [a]	Equity Award Adjustments [b]	Reported Change in the Actuarial Present Value of Pension Benefits [c]	Pension Benefit Adjustments [d]	Compensation Actually Paid to PEO
2022	$2,997,203	$1,468,740	$4,369,994	$—	$—	$5,898,457
2021	$2,056,987	$796,740	$80,094	$—	$—	$1,340,341

(a) The grant date fair value of equity awards represents the total of the amounts reported in the "Stock Awards" and "Option Awards" columns in the Summary Compensation Table for the applicable year.

(b) The equity award adjustments for each applicable year include the addition (or subtraction, as applicable) of the following: (i) the year-end fair value of any equity awards granted in the applicable year that are outstanding and unvested as of the end of the year; (ii) the amount of change as of the end of the applicable year (from the end of the prior fiscal year) in fair value of any awards granted in prior years that are outstanding and unvested as of the end of the applicable year; (iii) for awards

that are granted and vest in the same applicable year, the fair value as of the vesting date; (iv) for awards granted in prior years that vest in the applicable year, the amount equal to the change as of the vesting date (from the end of the prior fiscal year) in fair value; (v) for awards granted in prior years that are determined to fail to meet the applicable vesting conditions during the applicable year, a deduction for the amount equal to the fair value at the end of the prior fiscal year; and (vi) the dollar value of any dividends or other earnings paid on stock or option awards in the applicable year prior to the vesting date that are not otherwise reflected in the fair value of such award or included in any other component of total compensation for the applicable year. The valuation assumptions used to calculate fair values did not materially differ from those disclosed at the time of grant. The amounts deducted or added in calculating the equity award adjustments are as follows:

Year	Year End Fair Value of Equity Awards	Year over Year Change in Fair Value of Outstanding and Unvested Equity Awards	Fair Value as of Vesting Date of Equity Awards Granted and Vested in the Year	Year over Year Change in Fair Value of Equity Awards Granted in Prior Years that Vested in the Year	Fair Value at the End of the Prior Year of Equity Awards that Failed to Meet Vesting Conditions in the Year	Value of Dividends or other Earnings Paid on Stock or Option Awards not Otherwise Reflected in Fair Value or Total Compensation	Total Equity Award Adjustments
2022	$3,124,188	$381,355	$629,125	$235,326	$—	$—	$4,369,994
2021	$327,750	($267,010)	$110,000	($90,646)	$—	$—	$80,094

(4) The dollar amounts reported in column (d) represent the average of the amounts reported for the Company's Non-PEO NEOs as a group in the "Total" column of the Summary Compensation Table in each applicable year. The names of each of the Non-PEO NEOs included for purposes of calculating the average amounts in each applicable year are as follows: (i) for 2022, Olivia K. Bloom and Andrew J. Grethlein; and (ii) for 2021, Olivia K. Bloom, Andrew J Grethlein, Aleksandra Rizo, Anil Kapur and Melissa A. Kelly Behrs.

(5) The dollar amounts reported in column (e) represent the average amount of Compensation Actually Paid to our Non-PEO NEOs as a group, as computed in accordance with Item 402(v) of Regulation S-K. The dollar amounts do not reflect the actual average amount of compensation earned by or paid to the non-PEO NEOs as a group during the applicable year. The following adjustments were made to average total compensation for the Non-PEO NEOs as a group for each year to determine the compensation actually paid, using the same methodology described above in Note 3:

Year	Average Reported Summary Compensation Table Total for Non-PEO NEOs	Average Reported Value of Equity Awards	Average Equity Award Adjustments [a]	Average Compensation Actually Paid to Non-PEO NEOs
2022	$1,361,162	$524,550	$1,643,390	$2,480,002
2021	$1,155,449	$398,370	$75,758	$832,837

(a) The amounts deducted or added in calculating the total average equity award adjustments are as follows:

Year	Average Year End Fair Value of Equity Awards	Average Year over Year Change in Fair Value of Outstanding and Unvested Equity Awards	Average Fair Value as of Vesting Date of Equity Awards Granted and Vested in the Year	Average Year over Year Change in Fair Value of Equity Awards Granted in Prior Years that Vested in the Year	Average Fair Value at the End of the Prior Year of Equity Awards that Failed to Meet Vesting Conditions in the Year	Average Value of Dividends or other Earnings Paid on Stock or Option Awards not Otherwise Reflected in Fair Value or Total Compensation	Average Total Equity Award Adjustments
2022	$1,145,938	$185,608	$224,688	$87,156	$—	$—	$1,643,390
2021	$163,875	($115,972)	55,000	(27,145)	$—	$—	75,758

(6) Total Shareholder Return represents the return on a fixed investment of $100 in Geron common stock for the period beginning on the last trading day of 2020 through the last trading day of the applicable fiscal year.

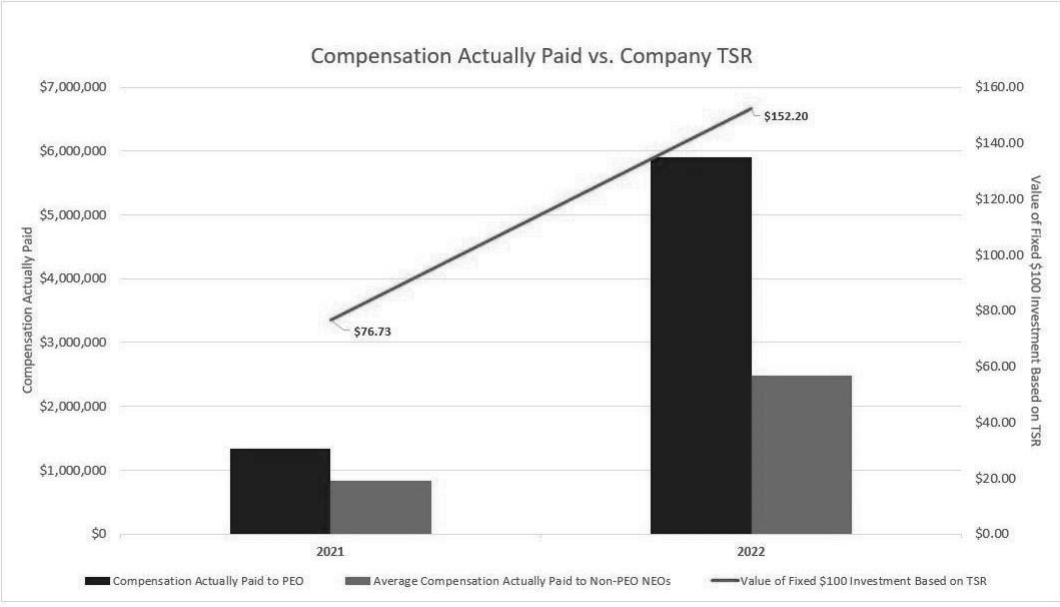
(7) The dollar amounts reported represent the amount of net income (loss) reflected in the Company's audited financial statements for the applicable year.

Analysis of the Information Presented in the Pay versus Performance Table

In accordance with Item 402(v) of Regulation S-K, we are providing the following descriptions of the relationships between information presented in the Pay Versus Performance table above.

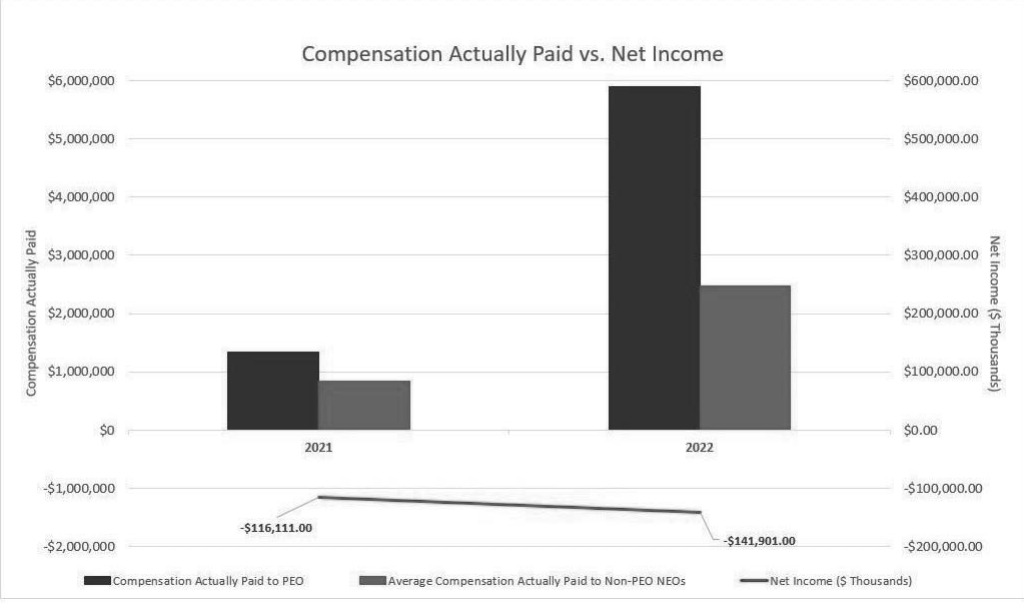
Compensation Actually Paid and Cumulative TSR

The following graph sets forth the relationship between Compensation Actually Paid to our PEO, the average of Compensation Actually Paid to our Non-PEO NEOs, and the Company's cumulative TSR over the two most recently completed fiscal years.



Compensation Actually Paid and Net Income (Loss)

The following graph sets forth the relationship between Compensation Actually Paid to our PEO, the average of Compensation Actually Paid to our Non-PEO NEOs, and the Company's net income (loss) over the two most recently completed fiscal years.



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, 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.

PROPOSAL 6

RATIFICATION OF SELECTION OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Audit Committee of the Board has selected Ernst & Young 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 the independent registered public accounting firm for ratification by our stockholders at the Annual Meeting. Ernst & Young LLP has served as our independent registered public accounting firm since 1992.

Representatives of Ernst & Young LLP are expected to be present at the Annual Meeting, will have an opportunity to make a statement if they so desire, and will be available to respond to appropriate questions from stockholders.

We have been informed by Ernst & Young LLP that, to the best of their knowledge, neither the firm nor any of its members or their associates has any direct financial interest or material indirect financial interest in Geron or our affiliates.

Stockholder ratification of the selection of Ernst & Young LLP as our independent registered public accounting firm is not required by our Bylaws or otherwise. However, the Board is submitting the selection of Ernst & Young LLP to our stockholders for ratification as a matter of good corporate practice. If our stockholders fail to ratify the selection, the Audit Committee and the Board will reconsider whether or not to retain that firm. Even if the selection is ratified, the Audit Committee and the Board in their discretion may direct the appointment of a different independent registered public accounting firm at any time during the year if they determine that such a change would be in the best interests of Geron and our stockholders.

Vote Required

Stockholder ratification of the selection of Ernst & Young LLP as our independent registered public accounting firm requires the affirmative vote of the holders of a majority of the shares having voting power present in person or represented by proxy at the Annual Meeting. Abstentions will have the same effect as a vote against this proposal. Since we have been advised by the NYSE that this proposal is considered “routine” under NYSE rules, we do not expect broker non-votes to exist in connection with this proposal.

The Board of Directors Unanimously Recommends That Stockholders Vote FOR Proposal 6

PRINCIPAL ACCOUNTANT FEES AND SERVICES

The Audit Committee maintains policies and procedures for the pre-approval of work performed by the independent registered public accounting firm. Under the Audit Committee's charter, all services of the independent registered public accounting firm must be approved in advance by the Audit Committee. Management recommendations will be considered in connection with such engagements, but management has no authority to approve engagements. For each quarterly Audit Committee meeting, management prepares a schedule of all fees paid to Ernst & Young LLP during the previous quarter and estimated fees for projects contemplated in the following quarter. The Chairperson of the Audit Committee must be notified at any time the fees for a specific project exceed 20% of the approved budget for authorization to continue the project.

Audit Fees and All Other Fees

The Audit Committee approved 100% of all audit and tax services provided by Ernst & Young LLP in 2022 and 2021. The total fees paid to Ernst & Young LLP for the last two fiscal years are as follows:

	Fiscal Year Ended December 31, 2022	Fiscal Year Ended December 31, 2021
Audit Fees[1]	$ 950,475	$ 847,000
Audit-Related Fees[2]	—	—
Tax Fees[3]	—	95,000
All Other Fees[4]	—	—
Total	$ 950,475	$ 942,000

(1) Audit Fees in 2022 and 2021 include the audit of annual consolidated financial statements included in our Annual Reports on Forms 10-K, reviews of quarterly consolidated financial statements included in our Quarterly Reports on Forms 10-Q, consultations on matters addressed during the audit or quarterly reviews, and services provided in connection with SEC filings, including consents and comment and comfort letters.

(2) Audit-related fees relate to fees billed for professional services provided in connection with assurance and related services that are reasonably related to the performance of the audit or review of our consolidated financial statements and that are not reported under Audit Fees.

(3) Amounts represent consultation, assessment and assistance in obtaining a refund of employer taxes available under the Employee Retention Credit provisions under the Coronavirus Aid Relief and Economic Security Act.

(4) This category consists of fees for all other services that are not reported above.

AUDIT COMMITTEE REPORT

The Audit Committee of Geron Corporation's Board of Directors currently is comprised of four independent directors which exceeds the minimum three directors as required by the listing standards of Nasdaq. The Audit Committee operates pursuant to a written charter that was last amended and restated by the Board in February 2022. A copy of the Audit Committee's amended and restated charter is available on our website at https://ir.geron.com/investors/corporate-governance/.

In 2022, the members of the Audit Committee were Ms. O'Farrell (Chairperson), Ms. Eastham, Dr. Lawlis and Mr. McDonald, who was appointed to the Audit Committee in November 2022. The Board has determined that all members of the Audit Committee are financially literate as required by Nasdaq. The Board has also determined that Ms. Eastham and Ms. O'Farrell are audit committee financial experts as defined by Nasdaq.

The function of the Audit Committee is to assist the Board in fulfilling its oversight responsibilities regarding:

(i) the quality and integrity of our consolidated financial statements,

(ii) our compliance with legal and regulatory requirements,

(iii) the qualifications and independence of the independent registered public accounting firm serving as our auditors, and

(iv) the performance of the independent registered public accounting firm.

Management is responsible for Geron's internal controls and financial reporting. The independent registered public accounting firm is responsible for performing an independent audit of Geron's consolidated financial statements in accordance with generally accepted auditing standards and to issue a report thereon. The Audit Committee's responsibility is to monitor and oversee these processes. In this context, the Audit Committee hereby reports as follows:

(1) The Audit Committee has reviewed and discussed the audited consolidated financial statements of the Company as of and for the year ended December 31, 2022 with management and the independent registered public accounting firm serving as the Company's independent auditors.

(2) The Audit Committee has discussed with the independent auditors the matters required to be discussed by Auditing Standard No. 1301 (Communication with Audit Committees) as adopted by the Public Company Accounting Oversight Board, other professional standards, membership provisions of the SEC Practice Session, and other SEC rules, as currently in effect.

(3) The Audit Committee has received the written disclosures and the letter from the independent auditors required by applicable requirements of the Public Company Accounting Oversight Board regarding the independent auditor's communications with the Audit Committee concerning independence, and has discussed with the independent auditors the independent auditor's independence.

(4) The Audit Committee has considered whether the independent auditor's provision of non-audit services to the Company is compatible with maintaining the independent auditor's independence.

Based on the reports and discussions described above, the Audit Committee recommended to the Board that the audited consolidated financial statements be included in Geron's Annual Report on Form 10-K for the year ended December 31, 2022, for filing with the SEC.

Submitted on March 13, 2023 by the members of the Audit Committee of the Board of Directors.

Karin Eastham
V. Bryan Lawlis, Ph.D.
John F. McDonald
Elizabeth G. O'Farrell (Chairperson)

This Section 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 Exchange Act of 1934, as amended, or the Securities Act of 1933, as amended, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing.

EQUITY COMPENSATION PLAN INFORMATION

The following table summarizes information with respect to equity awards under Geron's equity compensation plans at December 31, 2022:

Equity Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights[1]	Weighted-average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))[1]
	(a)	(b)	(c)
Equity compensation plans approved by security holders	50,012,532 [2]	$ 1.96	13,788,367 [3][4]
Equity compensation plans not approved by security holders	15,889,868 [5]	$ 1.61	5,714,126 [6]
Total	65,902,400	$ 1.87	19,502,493

(1) The table does not include information regarding the Geron 401(k) Plan. Under the Geron 401(k) Plan, all participating employees may contribute up to the annual Internal Revenue Service contribution limit. The Geron 401(k) Plan permits us to make matching contributions on behalf of plan participants, which matching contributions can be made in Common Stock that vests ratably over four years for each year of service completed by the employee, commencing from the date of hire, until it is fully vested when the employee has completed four years of service. As of December 31, 2022, there were approximately 420,000 shares of Common Stock held in this plan.

(2) Consists of 15,996,613 shares of Common Stock to be issued upon exercise of outstanding options under the 2011 Plan, 33,910,919 shares of Common Stock to be issued upon exercise of outstanding options under the 2018 Plan and 105,000 shares of Common Stock to be issued upon exercise of outstanding options under the 2006 Directors' Option Plan.

(3) Consists of 1,131,764 shares of Common Stock available for issuance under the 2014 Employee Stock Purchase Plan, including an estimated 220,000 shares subject to purchase during the current offering period that commenced January 1, 2023 and ends on June 30, 2023, and 12,656,603 shares of Common Stock available for issuance under the 2018 Plan.

(4) Shares reserved under the 2018 Plan can also be adjusted if (i) any shares of Common Stock subject to a stock award because the stock award expires or otherwise terminates without all of the shares covered by the stock award having been issued or is settled in cash, (ii) any shares of Common Stock issued pursuant to a stock award are forfeited back to or repurchased by the Company because of the failure to meet a contingency or condition required for the vesting of such shares, or (iii) with respect to a Full Value Award, any shares of Common Stock are reacquired or withheld (or not issued) by the Company to satisfy a tax withholding obligation in connection with the award, then such shares will again become available for issuance under the 2018 Plan (collectively, the "2018 Plan Returning Shares"). For each 2018 Plan Returning Share subject to a Full Value Award, or Prior Plans' Returning Share subject to a stock award other than a Prior Plans' Appreciation Award, the number of shares of Common Stock available for issuance under the 2018 Plan will increase by 1.3 shares, if the proposed amendments to the 2018 Plan are approved stockholders under Proposal 3; otherwise the increase is 2.0 shares.

(5) Consists of 15,889,868 shares of Common Stock to be issued upon exercise of outstanding options under the Inducement Plan.

(6) Consists of 4,798,007 shares of Common Stock available for issuance under the Inducement Plan and 916,119 shares of Common Stock available for issuance under the Directors Market Value Plan. The Inducement Plan provides for the grant of equity awards to individuals who were not previously Geron employees or directors, other than following a bona fide period of non-employment. All equity awards under the Inducement Plan are intended to meet the standards of Rule 5635(c)(4) of the Nasdaq Listing rules. The terms and conditions of the Inducement Plan and the equity awards to be granted thereunder are substantially similar to the 2018 Plan. Under the Directors Market Value Plan, to the extent permitted by the Director Compensation Policy, the cash compensation payable to a non-employee director who has properly elected to receive such cash compensation instead in the form of shares of Common Stock will be used to purchase shares of Common Stock from Geron under the Directors Market Value Plan on the date

that such cash compensation is payable to the non-employee director under the Director Compensation Policy. On such date, we apply the amount of such cash compensation to the purchase of shares of Common Stock, subject to the limitations and other terms of the Directors Market Value Plan. The purchase price of each share of Common Stock acquired pursuant to the Directors Market Value Plan is equal to the "market value" on the purchase date (which generally means the consolidated closing bid price per share of Common Stock as reported by Nasdaq on the purchase date). The Directors Market Value Plan is intended to qualify for the limited exemption from stockholder approval pursuant to the Nasdaq Listing Rule 5635(c)(2), as a plan that merely provides a convenient way to purchase shares from the Company at market value.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The following table sets forth the amount and percentage of the outstanding shares of Common Stock, which, according to the information supplied to us, are beneficially owned by: (i) each person, or group of affiliated persons, who is known by us to be a beneficial owner of more than 5% of our outstanding Common Stock, (ii) each of our directors and nominees for director, (iii) each of our Named Executive Officers and (iv) all current directors and executive officers as a group. Unless otherwise indicated, the address for each of the stockholders in the table below is c/o Geron Corporation, 919 E. Hillsdale Blvd., Suite 250, Foster City, California 94404. Except for the information based on Schedule 13G/A, as indicated in the footnotes below, beneficial ownership is stated as of March 1, 2023.

	Beneficial Ownership[1]	
Beneficial Owner	Number of Shares	Percent of Total
Directors/Nominees and Named Executive Officers:		
Dawn C. Bir[2]	356,000	*
Karin Eastham[3]	550,047	*
V. Bryan Lawlis, Ph.D.[4]	511,000	*
John F. McDonald[5]	—	*
Susan M. Molineaux, Ph.D.[6]	618,980	*
Elizabeth G. O'Farrell[7]	376,441	*
Robert J. Spiegel, M.D., FACP[8]	589,723	*
Olivia K. Bloom[9]	2,521,719	*
Andrew J. Grethlein, Ph.D.[10]	1,640,299	*
John A. Scarlett, M.D.[11]	7,286,761	1.4%
All directors and executive officers as a group (12 persons)[12]	16,285,344	3.1%
5% Beneficial Holders:		
RA Capital Management, L.P.[13] 200 Berkeley Street, 18th Floor, Boston, MA 02116	48,423,211	9.5%
BlackRock, Inc.[14] 55 East 52nd Street, New York, NY 10055	27,261,135	5.4%
Vivo Opportunity, LLC[15] 192 Lytton Avenue, Palo Alto, CA 94301	26,901,882	5.3%

* Represents beneficial ownership of less than 1% of the outstanding Common Stock as of March 1, 2023.

(1) Beneficial ownership is determined in accordance with the rules of the SEC. In computing the number of shares beneficially owned by a person and the percentage of ownership of that person, shares of Common Stock exercisable pursuant to the exercise of options or warrants held by that person that are currently exercisable or exercisable within 60 days of March 1, 2023 are deemed outstanding. Such shares, however, are not deemed outstanding for the purpose of computing the percentage ownership of each other person. Applicable percentages are based on 508,684,887 shares outstanding on March 1, 2023, adjusted as required by rules promulgated by the SEC. The shares outstanding on March 1, 2023 do not include any pre-funded warrants that may be held by the beneficial owners listed above. The persons named in this table, to the best of our knowledge, have sole voting and investment power with respect to all shares of Common Stock shown as beneficially owned by them, subject to community property laws where applicable and except as indicated in the other footnotes to this table.

(2) Consists of 356,000 shares issuable upon the exercise of outstanding options held by Dawn C. Bir exercisable within 60 days of March 1, 2023.

(3) Consists of 74,047 shares held directly by Karin Eastham and 476,000 shares issuable upon the exercise of outstanding options held by Ms. Eastham exercisable within 60 days of March 1, 2023.

(4) Consists of 511,000 shares issuable upon the exercise of outstanding options held by V. Bryan Lawlis exercisable within 60 days of March 1, 2023.

(5) Mr. McDonald was appointed to the Board in September 2022. In accordance with the Director Compensation Policy, Mr. McDonald was granted a stock option to purchase 200,000 shares of our Common Stock, which vests annually over three years upon each anniversary date of appointment to the Board. As a result, Mr. McDonald did not have any shares issuable upon the exercise of outstanding options exercisable within 60 days of March 1, 2023.

(6) Consists of 107,980 shares held by the Molineaux Family Trust and 511,000 shares issuable upon the exercise of outstanding options held by Dr. Molineaux exercisable within 60 days of March 1, 2023.

(7) Consists of 800 shares held directly by Elizabeth G. O'Farrell, 19,641 shares beneficially owned by Ms. O'Farrell's spouse and 356,000 shares issuable upon the exercise of outstanding options held by Ms. O'Farrell exercisable within 60 days of March 1, 2023.

(8) Consists of 148,723 shares held directly by Robert J. Spiegel and 441,000 shares issuable upon exercise of outstanding options held by Dr. Spiegel exercisable within 60 days of March 1, 2023.

(9) Consists of 115,839 shares held directly by Olivia K. Bloom and 2,405,880 shares issuable upon the exercise of outstanding options held by Ms. Bloom exercisable within 60 days of March 1, 2023.

(10) Consists of 2,267 shares held directly by Andrew J. Grethlein and 1,638,032 shares issuable upon the exercise of outstanding options held by Dr. Grethlein exercisable within 60 days of March 1, 2023.

(11) Consists of 125,000 shares held by the John A. Scarlett III 1999 Trust and 7,161,761 shares issuable upon exercise of outstanding options held by Dr. Scarlett exercisable within 60 days of March 1, 2023.

(12) Consists of shares beneficially owned by all our current directors and executive officers as a group.

(13) The indicated ownership is based solely on a Schedule 13G/A filed with the SEC on February 14, 2023 for RA Capital Management, L.P. ("RA Capital"), Peter Kolchinsky, Rajeev Shah and RA Capital Healthcare Fund, L.P. The Schedule 13G/A provides information only as of December 31, 2022, and consequently, the beneficial ownership of the above-mentioned reporting person may have changed since December 31, 2022. Beneficial ownership consists of (a) 12,930,711 shares and (b) 35,492,500 shares that may be acquired upon the exercise of warrants, as limited by a provision which precludes the exercise of warrants to the extent that, following exercise, the reporting person, together with its affiliates and other attribution parties, would own more than 9.99% of the Common Stock outstanding. RA Capital Healthcare Fund GP, LLC is the general partner of the RA Capital Healthcare Fund, L.P. (the "Fund"). The ownership calculation does not include the full pre-funded warrants to purchase 51,430,477 shares of Common Stock held by the Fund. The general partner of RA Capital is RA Capital Management GP, LLC, of which Dr. Kolchinsky and Mr. Shah are the controlling persons. RA Capital serves as investment adviser for the Fund and may be deemed a beneficial owner of any Geron shares held by the Fund. The Fund has delegated to RA Capital the sole power to vote and the sole power to dispose of all securities held in the Fund's portfolio, including the above-mentioned shares. Because the Fund has divested voting and investment power over the securities it holds and may not revoke that delegation on less than 61 days' notice, the Fund disclaims beneficial ownership of the securities it holds for purposes of Section 13(d) of the Act. As managers of RA Capital, Dr. Kolchinsky and Mr. Shah may be deemed beneficial owners, for purposes of Section 13(d) of the Act, of any Geron shares beneficially owned by RA Capital. Such persons and entities disclaim beneficial ownership of the shares listed herein, except to the extent of any pecuniary interest therein.

(14) The indicated ownership is based solely on a Schedule 13G/A filed with the SEC by BlackRock, Inc. ("BlackRock") on January 31, 2023. The Schedule 13G/A provides information only as of December 31, 2022, and, consequently, the beneficial ownership of the above-mentioned reporting person may have changed since December 31, 2022. BlackRock has sole voting power with respect to 26,730,085 shares and sole dispositive power with respect to 27,261,135 shares. BlackRock is the beneficial owner of 27,261,135 shares.

(15) The indicated ownership is based on a Schedule 13G/A filed with the SEC by Vivo Opportunity, LLC ("Vivo") on February 14, 2023. The Schedule 13G/A provides information only as of December 31, 2022, and, consequently, the beneficial ownership of the above-mentioned reporting person may have changed since December 31, 2022. Vivo has reported sole dispositive power of 19,282,834 shares and warrants exercisable into 7,619,048 shares of our Common Stock held of record by Vivo Opportunity Fund Holdings, L.P. Vivo Opportunity, LLC is the general partner of Vivo Opportunity Fund Holdings, L.P. The voting members of Vivo Opportunity, LLC are Gaurav Aggarwal, Hongbo Lu, Kevin Dai, Frank Kung, and Michael Chang, none of whom has individual voting or investment power with respect to these shares and each of whom disclaims beneficial ownership of such shares.

CERTAIN TRANSACTIONS

Certain Transactions With or Involving Related Persons

Since January 1, 2020, there has not been, nor is there currently proposed, any transaction or series of similar transactions to which we were or are to be a party in which the amount involved exceeded the lesser of (i) $120,000 or (ii) 1% of the average of our total assets at December 31, 2021 and 2022 and in which any current director, executive officer, holder of more than 5% of our Common Stock, or any immediate family member of any of the foregoing persons, had or will have a direct or indirect material interest other than with respect to compensation arrangements described under the sections entitled "Executive Compensation", "Summary Compensation Table", "Narrative Disclosure to Summary Compensation Table and Outstanding Equity Awards Table" and "Compensation of Directors."

Policies and Procedures

Our Audit Committee is responsible for reviewing and approving all related party transactions, which would include a transaction, arrangement or relationship (or any series of similar transactions, arrangements or relationships) in which we and any "related person" are participants involving an amount the lesser of $120,000 or 1% of the average of our total assets at year-end for the last two completed fiscal years, not including transactions involving compensation for services provided to Geron as an employee, director, consultant or similar capacity by a related person. Related parties include any of our directors or members of our executive management team, certain of our stockholders and their immediate family members. This obligation is set forth in writing in the Audit Committee charter. A copy of the Audit Committee charter is available on our website at https://ir.geron.com/investors/corporate-governance/.

Where a transaction has been identified as a related-person transaction, management would present information regarding the proposed related-person transaction to the Audit Committee (or, where Audit Committee approval would be inappropriate, to another independent body of the Board) for consideration and approval or ratification. The presentation would include a description of, among other things, the material facts, the interests, direct and indirect, of the related persons, the benefits to Geron of the transaction and whether any alternative transactions were available. To identify related-person transactions in advance, the Audit Committee relies on information supplied by our management and directors. In considering related-person transactions, the Audit Committee takes into account the relevant available facts and circumstances including, but not limited to:

(i) the risks, costs and benefits to Geron;

(ii) the impact on a director's independence in the event the related person is a director, immediate family member of a director or an entity with which a director is affiliated;

(iii) the terms of the transaction;

(iv) the availability of other sources for comparable services or products; and

(v) the terms available to or from, as the case may be, unrelated third parties or to or from employees generally.

In the event a director has an interest in the proposed transaction, the director must recuse himself or herself from the deliberations and approval. In determining whether to approve, ratify or reject a related-person transaction, the Audit Committee considers, in light of known circumstances, whether the transaction is in, or is not inconsistent with, the best interests of Geron and our stockholders, as the Audit Committee determines in the good faith exercise of its discretion.

OTHER MATTERS

Stockholder Nominations and Proposals for 2024 Annual Meeting

We expect to hold our annual meeting of stockholders in 2024 (the "2024 Annual Meeting") in May 2024. All proposals or director nominations by stockholders intended to be presented at the 2024 Annual Meeting must be directed to the attention of our Corporate Secretary, at the address set forth on the first page of this Proxy Statement.

To be considered for inclusion in next year's proxy materials, your proposal must be submitted in writing by December 22, 2023, to our Corporate Secretary at Geron Corporation, 919 E. Hillsdale Blvd., Suite 250, Foster City, California, 94404, and must comply with all applicable requirements of Rule 14a-8 promulgated under the Exchange Act. However, if our 2024 Annual Meeting is not held between May 1, 2024 and June 30, 2024, then the deadline will be a reasonable time prior to the time we begin to print and send our proxy materials.

If you wish to bring a proposal before the stockholders or nominate a director at the 2024 Annual Meeting, but you are not requesting that your proposal or nomination be included in next year's proxy materials, you must notify our Corporate Secretary, in writing, not earlier than February 1, 2024 and not later than March 2, 2024. However, if the 2024 Annual Meeting is not held between May 1, 2024 and July 30, 2024, the notice must be delivered no later than the 90th day prior to the 2024 Annual Meeting or, if later, the 10th day following the day on which public disclosure of the date of the 2024 Annual Meeting is made. You are also advised to review our Bylaws, which contain additional requirements about advance notice of stockholder proposals and director nominations proposals and director nominations.

In addition to satisfying the foregoing requirements under our Bylaws, to comply with the universal proxy rules, stockholders who intend to solicit proxies in support of director nominees other than our Board of Director's nominees must provide in their notice any additional information required by Rule 14a-19 promulgated under the Exchange Act.

Director Nominees Recommended by Stockholders

The Nominating and Corporate Governance Committee, to date, has not adopted a formal policy with regard to the consideration of director candidates recommended by stockholders and will consider director candidates recommended by stockholders on a case-by-case basis, as appropriate. Stockholders who wish to recommend individuals for consideration by the Nominating and Corporate Governance Committee should send written notice to the Nominating and Corporate Governance Committee Chairman, Geron Corporation, 919 E. Hillsdale Blvd., Suite 250, Foster City, California 94404, within the time periods set forth above. Such notification should set forth all information relating to such nominee as is required to be disclosed in solicitations of proxies for elections of directors pursuant to Regulation 14A under the Exchange Act, including such person's written consent to being named in a proxy statement as a nominee and to serving as a director if elected, the name and address of such stockholder or beneficial owner on whose behalf the nomination is being made, the class and number of shares of the Company owned beneficially and of record by such stockholder or beneficial owner, and all information regarding the nominee that would be required to be included in the Company's proxy statement by the rules of the SEC, including the nominee's age, business experience for the past five years and any directorships held by the nominee during the past five years. The Nominating and Corporate Governance Committee does not intend to alter the procedure by which it evaluates candidates based on whether the candidate was recommended by a stockholder or not.

Director Qualifications

The Nominating and Corporate Governance Committee believes that nominees for election to the Board must possess certain minimum qualifications and attributes. The nominee:

- must meet the objective independence requirements set forth by the SEC and Nasdaq;
- must exhibit strong personal integrity, character and ethics, and a commitment to ethical business and accounting practices;
- must not be involved in on-going litigation with the Company or be employed by an entity which is engaged in such litigation; and
- must not be the subject of any on-going criminal investigations, including investigations for fraud or financial misconduct.

In addition, the Nominating and Corporate Governance Committee may consider the following criteria, among others:

(i) experience in corporate management, such as serving as an officer or former officer of a publicly held company, and a general understanding of marketing, finance and other elements relevant to the success of a publicly traded company in today's business environment;

(ii) experience in our industry and with relevant social policy concerns;

(iii) experience as a board member of other publicly held companies;

(iv) expertise in an area of our operations;

(v) practical and mature business judgment, including the ability to make independent analytical inquiries;

(vi) diversity of personal background, perspective, experience and other characteristics, such as gender, gender identity, ethnicity, sexual orientation, age, as well as candidates who self-identify their gender as female and candidates from underrepresented communities; and

(vii) diversity of business and professional background, perspective and experience relevant to the success of the Company.

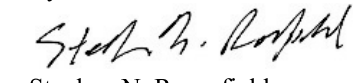
In general, the Nominating and Corporate Governance Committee aspires the Board to be comprised of individuals that represent a diversity of professional experiences and perspectives and who portray characteristics of diligence, commitment, mutual respect and professionalism with an emphasis on consensus building. The Board does not follow any ratio or formula to determine the appropriate mix. Rather, it uses its judgment to identify nominees whose backgrounds, attributes and experiences, taken as a whole, will contribute to the high standards of board service at Geron. As stated in our Nominating and Corporate Governance Committee Charter and our Corporate Governance Guidelines, as part of the director search process, the Nominating and Corporate Governance Committee endeavors to consider qualified candidates, including candidates who self-identify their gender as female and candidates from underrepresented communities, who meet the relevant business and search criteria.

Directors are expected to rigorously prepare for, attend and participate in Board meetings and meetings of the committees of the Board on which they serve, to ask direct questions and require straight answers, and to spend the time needed and meet as frequently as necessary to properly discharge their responsibilities and duties as directors. Each Board member is expected to ensure that other existing and planned future commitments do not materially interfere with the member's service as an outstanding director.

General

Your proxy is solicited on behalf of our Board. Unless otherwise directed, proxies will be voted at the virtual Annual Meeting (or an adjournment or postponement thereof), "FOR" both of the nominees listed in Proposal 1, "FOR" Proposals 2, 3, 5 and 6, and "1 YEAR" with respect to Proposal 4. If any matter other than those described in this Proxy Statement were to be properly submitted for a vote at the virtual Annual Meeting, or with respect to any adjournment or postponement thereof, the proxy holders appointed by the Board will have the discretion to vote on those matters for you as they see fit.

By Order of the Board of Directors,



Stephen N. Rosenfield
Executive Vice President, Chief Legal Officer and Corporate Secretary

April 12, 2023

APPENDIX A

CERTIFICATE OF AMENDMENT
OF THE RESTATED CERTIFICATE OF INCORPORATION
OF GERON CORPORATION,
a Delaware corporation

The undersigned, Stephen N. Rosenfield, hereby certifies that:

FIRST. He is the duly elected and acting Executive Vice President, Chief Legal Officer and Corporate Secretary of Geron Corporation, a Delaware corporation (the "Corporation").

SECOND. The Corporation's Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware (the "Secretary of State") on March 24, 1998; a Certificate of Designation was filed with the Secretary of State on March 27, 1998; a Certificate of Amendment of Restated Certificate of Incorporation was filed with the Secretary of State on December 14, 1999; a Certificate of Amendment of Restated Certificate of Incorporation was filed with the Secretary of State on June 28, 2000; a Certificate of Designation was filed with the Secretary of State on August 1, 2001; a Certificate of Designation was filed with the Secretary of State on August 1, 2001; a Certificate of Amendment of the Restated Certificate of Incorporation was filed with the Secretary of State on May 22, 2002; a Certificate of Amendment of the Restated Certificate of Incorporation was filed with the Secretary of State on May 25, 2006; a Certificate of Amendment of the Restated Certificate of Incorporation was filed with the Secretary of State on May 17, 2012; a Certificate of Amendment of the Restated Certificate of Incorporation was filed with the Secretary of State on June 6, 2019; and a Certificate of Amendment of the Restated Certificate of Incorporation was filed with the Secretary of State on May 12, 2021.

THIRD. The amendment of the Restated Certificate of Incorporation of the Corporation herein certified was duly adopted by this Corporation's Board of Directors and approved by the Corporation's stockholders in accordance with the applicable provisions of Section 242 of the General Corporation Law of the State of Delaware.

FOURTH. Article IV, Paragraph (A) of the Corporation's Restated Certificate of Incorporation is hereby amended to read in its entirety as follows:

"(A) Class of Stock. The Corporation is authorized to issue two classes of stock to be designated, respectively, "Common Stock" and "Preferred Stock." The total number of shares which the Corporation is authorized to issue is One Billion Three Hundred Fifty-Three Million (1,353,000,000) shares. One Billion Three Hundred Fifty Million (1,350,000,000) shares shall be Common Stock, par value $0.001 per share, and Three Million (3,000,000) shares shall be Preferred Stock, par value $0.001 per share."

FIFTH. All other provisions of the Restated Certificate of Incorporation shall remain in full force and effect.

IN WITNESS WHEREOF, the undersigned has caused this Certificate of Amendment to be duly executed on behalf of the Corporation at Foster City, California this ___ day of _____ 2023.

GERON CORPORATION,
a Delaware corporation

By:
Stephen N. Rosenfield
Executive Vice President, Chief Legal Officer and Corporate Secretary

APPENDIX B

GERON CORPORATION
2018 EQUITY INCENTIVE PLAN
ADOPTED BY THE BOARD OF DIRECTORS: MARCH 27, 2018
APPROVED BY THE STOCKHOLDERS: MAY 15, 2018
AMENDED BY THE BOARD OF DIRECTORS: FEBRUARY 12, 2020
APPROVED BY THE STOCKHOLDERS: JUNE 5, 2020
AMENDED BY THE BOARD OF DIRECTORS: FEBRUARY 2, 2021
APPROVED BY THE STOCKHOLDERS: MAY 11, 2021
AMENDED BY THE BOARD OF DIRECTORS: FEBRUARY 16, 2022
APPROVED BY THE STOCKHOLDERS: MAY 10, 2022
AMENDED BY THE BOARD OF DIRECTORS: MARCH 18, 2023
APPROVED BY THE STOCKHOLDERS: [●]

I. GENERAL.

(a) Successor to and Continuation of Prior Plans. The Plan is intended as the successor to and continuation of the Geron Corporation 2011 Incentive Award Plan (the "***2011 Plan***") and the Geron Corporation 1992 Stock Option Plan (the "***1992 Plan***"), the Geron Corporation 1996 Directors' Stock Option Plan (the "***1996 Directors' Plan***") and the Geron Corporation Amended and Restated 2002 Equity Incentive Plan (the "***2002 Plan***", and together with the 2011 Plan, the 1992 Plan, the 1996 Directors' Plan, the "***Prior Plans***"). Following the Effective Date, no additional stock awards may be granted under the Prior Plans. Any unallocated shares remaining available for grant under the Prior Plans as of 12:01 a.m., Pacific Time on the Effective Date (the "***Prior Plans' Available Reserve***") will cease to be available under the Prior Plans at such time and will be added to the Share Reserve (as further described in Section 3(a) below) and be then immediately available for grant and issuance pursuant to Stock Awards granted under the Plan. In addition, from and after 12:01 a.m., Pacific Time on the Effective Date, all outstanding stock awards granted under the Prior Plans will remain subject to the terms of such Prior Plans, as applicable; *provided, however*, that any shares subject to outstanding stock awards granted under the Prior Plans that (i) expire or terminate for any reason prior to exercise or settlement, (ii) are forfeited, cancelled or otherwise returned to the Company because of the failure to meet a contingency or condition required for the vesting of such shares, or (iii) other than with respect to outstanding options and stock appreciation rights granted under the Prior Plans, with respect to which the exercise or strike price is at least one hundred percent (100%) of the Fair Market Value of the Common Stock subject to the option or stock appreciation right on the date of grant (the "***Prior Plans' Appreciation Awards***"), are reacquired or withheld (or not issued) by the Company to satisfy a tax withholding obligation in connection with a stock award (collectively, the "***Prior Plans' Returning Shares***") will immediately be added to the Share Reserve (as further described in Section 3(a) below) as and when such shares become Prior Plans' Returning Shares and become available for issuance pursuant to Stock Awards granted hereunder. All Stock Awards granted on or after 12:01 a.m., Pacific Time on the Effective Date will be subject to the terms of this Plan.

(b) Eligible Award Recipients. Employees, Directors and Consultants are eligible to receive Stock Awards under this Plan.

(c) Available Stock Awards. The Plan provides for the grant of the following types of Stock Awards: (i) Incentive Stock Options, (ii) Nonstatutory Stock Options, (iii) Stock Appreciation Rights, (iv) Restricted Stock Awards, (v) Restricted Stock Unit Awards, (vi) Performance Stock Awards, and (vii) Other Stock Awards.

(d) Purpose. The Plan, through the granting of Stock Awards, is intended to help the Company and any Affiliate secure and retain the services of eligible Stock Award recipients, provide incentives for such persons to exert maximum efforts for the success of the Company and any Affiliate and provide a means by which the eligible recipients may benefit from increases in value of the Common Stock. The Plan is also intended to provide long-term incentives that align the interests of our eligible Stock Award recipients with the interests of our stockholders.

II. ADMINISTRATION.

(a) Administration by Board. The Board will administer the Plan. The Board may delegate administration of the Plan to a Committee or Committees, as provided in Section 2(c).

(b) Powers of Board. The Board will have the power, subject to, and within the limitations of, the express provisions of the Plan:

(i) To determine (A) who will be granted Stock Awards; (B) when and how each Stock Award will be granted; (C) what type of Stock Award will be granted; (D) the provisions of each Stock Award (which need not be identical), including when a person will be permitted to exercise or otherwise receive cash or Common Stock under the Stock Award; (E) the number of shares of Common Stock subject to, or the cash value of, a Stock Award; and (F) the Fair Market Value applicable to a Stock Award.

(ii) To construe and interpret the Plan and Stock Awards granted under it, and to establish, amend and revoke rules and regulations for administration of the Plan and Stock Awards. The Board, in the exercise of these powers, may correct any defect, omission or inconsistency in the Plan or in any Stock Award Agreement, in a manner and to the extent it will deem necessary or expedient to make the Plan or Stock Award fully effective.

(iii) To settle all controversies regarding the Plan and Stock Awards granted under it.

(iv) To accelerate, in whole or in part, the time at which a Stock Award may be exercised or vest (or the time at which cash or shares of Common Stock may be issued in settlement thereof).

(v) To suspend or terminate the Plan at any time. Except as otherwise provided in the Plan or a Stock Award Agreement, suspension or termination of the Plan will not materially impair a Participant's rights under his or her then-outstanding Stock Award without his or her written consent except as provided in subsection (viii) below.

(vi) To amend the Plan in any respect the Board deems necessary or advisable, including, without limitation, by adopting amendments relating to Incentive Stock Options and certain nonqualified deferred compensation under Section 409A of the Code and/or to make the Plan or Stock Awards granted under the Plan compliant with the requirements for Incentive Stock Options or exempt from or compliant with the requirements for nonqualified deferred compensation under Section 409A of the Code, subject to the limitations, if any, of applicable law. However, if required by applicable law or listing requirements (including NASDAQ Listing Rule 5635), and except as provided in Section 9(a) relating to Capitalization Adjustments, the Company will seek stockholder approval of any amendment of the Plan that (A) materially increases the number of shares of Common Stock available for issuance under the Plan, (B) materially expands the class of individuals eligible to receive Stock Awards under the Plan, (C) materially increases the benefits accruing to Participants under the Plan, (D) materially reduces the price at which shares of Common Stock may be issued or purchased under the Plan, or (E) materially expands the types of Stock Awards available for issuance under the Plan. Except as provided in the Plan (including Section 2(b)(viii)) or a Stock Award Agreement, no amendment of the Plan will materially impair a Participant's rights under an outstanding Stock Award without the Participant's written consent.

(vii) To submit any amendment to the Plan for stockholder approval, including, but not limited to, amendments to the Plan intended to satisfy the requirements of (A) Section 422 of the Code regarding incentive stock options or (B) Rule 16b-3.

(viii) To approve forms of Stock Award Agreements for use under the Plan and to amend the terms of any one or more Stock Awards, including, but not limited to, amendments to provide terms more favorable to the Participant than previously provided in the Stock Award Agreement, subject to any specified limits in the Plan that are not subject to Board discretion; *provided, however,* that a Participant's rights under any Stock Award will not be impaired by any such amendment unless (A) the Company requests the consent of the affected Participant, and (B) such Participant consents in writing. Notwithstanding the foregoing, (1) a Participant's rights will not be deemed to have been impaired by any such amendment if the Board, in its sole discretion, determines

that the amendment, taken as a whole, does not materially impair the Participant's rights, and (2) subject to the limitations of applicable law, if any, the Board may amend the terms of any one or more Stock Awards without the affected Participant's consent (A) to maintain the qualified status of the Stock Award as an Incentive Stock Option under Section 422 of the Code; (B) to change the terms of an Incentive Stock Option, if such change results in impairment of the Stock Award solely because it impairs the qualified status of the Stock Award as an Incentive Stock Option under Section 422 of the Code; (C) to clarify the manner of exemption from, or to bring the Stock Award into compliance with, Section 409A of the Code; or (D) to comply with other applicable laws or listing requirements.

(ix) Generally, to exercise such powers and to perform such acts as the Board deems necessary or expedient to promote the best interests of the Company and that are not in conflict with the provisions of the Plan or Stock Awards.

(x) To adopt such procedures and sub-plans as are necessary or appropriate to permit participation in the Plan by Employees, Directors or Consultants who are foreign nationals or employed outside the United States (provided that Board approval will not be necessary for immaterial modifications to the Plan or any Stock Award Agreement that are required for compliance with the laws of the relevant foreign jurisdiction).

(c) Delegation to Committee.

(i) **General.** The Board may delegate some or all of the administration of the Plan to a Committee or Committees. If administration of the Plan is delegated to a Committee, the Committee will have, in connection with the administration of the Plan, the powers theretofore possessed by the Board that have been delegated to the Committee, including the power to delegate to a subcommittee of the Committee any of the administrative powers the Committee is authorized to exercise (and references in this Plan to the Board will thereafter be to the Committee or subcommittee, as applicable). Any delegation of administrative powers will be reflected in resolutions, not inconsistent with the provisions of the Plan, adopted from time to time by the Board or Committee (as applicable). The Committee may, at any time, abolish the subcommittee and/or revest in the Committee any powers delegated to the subcommittee. The Board may retain the authority to concurrently administer the Plan with the Committee and may, at any time, revest in the Board some or all of the powers previously delegated.

(ii) **Rule 16b-3 Compliance.** The Committee may consist solely of two or more Non-Employee Directors, in accordance with Rule 16b-3.

(d) Delegation to an Officer. The Board may delegate to one or more Officers the authority to do one or both of the following (i) designate Employees who are not Officers to be recipients of Options and Stock Appreciation Rights ("SARs") (and, to the extent permitted by applicable law, other Stock Awards) and, to the extent permitted by applicable law, the terms of such Stock Awards, and (ii) determine the number of shares of Common Stock to be subject to such Stock Awards granted to such Employees; provided, however, that the Board resolutions regarding such delegation will specify the total number of shares of Common Stock that may be subject to the Stock Awards granted by such Officer and that such Officer may not grant a Stock Award to himself or herself. Any such Stock Awards will be granted on the form of Stock Award Agreement most recently approved for use by the Committee or the Board, unless otherwise provided in the resolutions approving the delegation authority. The Board may not delegate authority to an Officer who is acting solely in the capacity of an Officer (and not also as a Director) to determine the Fair Market Value pursuant to Section 13(s)(iii) below.

(e) Effect of Board's Decision. All determinations, interpretations and constructions made by the Board in good faith will not be subject to review by any person and will be final, binding and conclusive on all persons.

(f) Repricing; Cancellation and Re-Grant of Stock Awards. Neither the Board nor any Committee will have the authority to (i) reduce the exercise, purchase or strike price of any outstanding Option or SAR under the Plan, or (ii) cancel any outstanding Option or SAR that has an exercise price or strike price greater than the then-current Fair Market Value of the Common Stock in exchange for cash or other Stock Awards under the Plan, unless the stockholders of the Company have approved such an action within 12 months prior to such an event.

(g) Dividends and Dividend Equivalents. Dividends or dividend equivalents may be paid or credited, as applicable, with respect to any shares of Common Stock subject to a Stock Award, as determined by the Board and contained in the applicable Stock Award Agreement; *provided, however*, that (i) no dividends or dividend equivalents may be paid with respect to any such shares before the date such shares have vested under the terms of such Stock Award Agreement, (ii) any dividends or dividend equivalents that are credited with respect to any such shares will be subject to all of the terms and conditions applicable to such shares under the terms of such Stock Award Agreement (including, but not limited to, any vesting conditions), and (iii) any dividends or dividend equivalents that are credited with respect to any such shares will be forfeited to the Company on the date, if any, such shares are forfeited to or repurchased by the Company due to a failure to meet any vesting conditions under the terms of such Stock Award Agreement.

III. SHARES SUBJECT TO THE PLAN.

(a) Share Reserve.

(i) Subject to Section 9(a) relating to Capitalization Adjustments, the aggregate number of shares of Common Stock that may be issued pursuant to Stock Awards from and after the Effective Date will not exceed (A) 85,455,419 shares (which number is the sum of (i) the number of shares (2,895,419) subject to the Prior Plans' Available Reserve, (ii) 10,000,000 shares subject to the Plan as of the Effective Date, (iii) an additional 5,700,000 shares that were approved at the Company's 2020 Annual Meeting of Stockholders, (iv) an additional 12,500,000 shares that were approved at the Company's 2021 Annual Meeting of Stockholders, (v) an additional 11,000,000 shares that were approved at the Company's 2022 Annual Meeting of Stockholders, and (vi) an additional 43,360,000 shares that were approved at the Company's 2023 Annual Meeting of Stockholders), *plus* (B) the Prior Plans' Returning Shares, if any, which become available for grant under this Plan from time to time (such aggregate number of shares described in (A) and (B) above, the "***Share Reserve***").

(ii) For clarity, the Share Reserve in this Section 3(a) is a limitation on the number of shares of Common Stock that may be issued pursuant to the Plan. Accordingly, this Section 3(a) does not limit the granting of Stock Awards except as provided in Section 7(a). Shares may be issued in connection with a merger or acquisition as permitted by NASDAQ Listing Rule 5635(c) or, if applicable, NYSE Listed Company Manual Section 303A.08, AMEX Company Guide Section 711 or other applicable rule, and such issuance will not reduce the number of shares available for issuance under the Plan.

(iii) Subject to Section 3(b), the number of shares of Common Stock available for issuance under the Plan will be reduced by: (A) one share for each share of Common Stock issued pursuant to an Option or SAR with respect to which the exercise or strike price is at least 100% of the Fair Market Value of the Common Stock subject to the Option or SAR on the date of grant; and (B) (i) one and thirty hundredth (1.3) shares for each share of Common Stock issued pursuant to a Full Value Award granted under the Plan on or after May 31, 2023, and (ii) two (2.0) shares for each share of Common Stock issued pursuant to a Full Value Award granted under the Plan prior to May 31, 2023.

(b) Reversion of Shares to the Share Reserve.

(i) Shares Available For Subsequent Issuance. If (A) any shares of Common Stock subject to a Stock Award are not issued because such Stock Award or any portion thereof expires or otherwise terminates without all of the shares covered by such Stock Award having been issued or is settled in cash (*i.e.*, the Participant receives cash rather than stock), (B) any shares of Common Stock issued pursuant to a Stock Award are forfeited back to or repurchased by the Company because of the failure to meet a contingency or condition required for the vesting of such shares, or (C) with respect to a Full Value Award, any shares of Common Stock are reacquired or withheld (or not issued) by the Company to satisfy a tax withholding obligation in connection with such Full Value Award, such shares will again become available for issuance under the Plan (collectively, the "***2018 Plan Returning Shares***"). For each (1) 2018 Plan Returning Share subject to a Full Value Award or (2) Prior Plans' Returning Share subject to a stock award other than a Prior Plans' Appreciation Award, that (i) returns to the Plan

on or after May 31, 2023, the number of shares of Common Stock available for issuance under the Plan will increase by one and thirty hundredth (1.3) shares, and (ii) returned to the Plan prior to May 31, 2023, the number of shares of Common Stock available for issuance under the Plan increased by two (2.0) shares.

(ii) **Shares Not Available For Subsequent Issuance.** Any shares of Common Stock reacquired or withheld (or not issued) by the Company to satisfy the exercise or purchase price of a Stock Award will no longer be available for issuance under the Plan, including any shares subject to a Stock Award that are not delivered to a Participant because such Stock Award is exercised through a reduction of shares subject to such Stock Award (*i.e.*, "net exercised"). In addition, any shares reacquired or withheld (or not issued) by the Company to satisfy a tax withholding obligation in connection with an Option or Stock Appreciation Right or a Prior Plans' Appreciation Award, or any shares repurchased by the Company on the open market with the proceeds of the exercise or strike price of an Option or Stock Appreciation Right or a Prior Plans' Appreciation Award will no longer be available for issuance under the Plan.

(c) **Incentive Stock Option Limit.** Subject to the Share Reserve and Section 9(a) relating to Capitalization Adjustments, the aggregate maximum number of shares of Common Stock that may be issued pursuant to the exercise of Incentive Stock Options will be 171,000,000 shares of Common Stock.

(d) **Source of Shares.** The stock issuable under the Plan will be shares of authorized but unissued or reacquired Common Stock, including shares repurchased by the Company on the open market or otherwise.

IV. ELIGIBILITY.

(a) **Eligibility for Specific Stock Awards.** Incentive Stock Options may be granted only to employees of the Company or a "parent corporation" or "subsidiary corporation" thereof (as such terms are defined in Sections 424(e) and 424(f) of the Code). Stock Awards other than Incentive Stock Options may be granted to Employees, Directors and Consultants; provided, however, that Stock Awards may not be granted to Employees, Directors and Consultants who are providing Continuous Service only to any "parent" of the Company, as such term is defined in Rule 405, unless (i) the stock underlying such Stock Awards is treated as "service recipient stock" under Section 409A of the Code (for example, because the Stock Awards are granted pursuant to a corporate transaction such as a spin off transaction) or (ii) the Company, in consultation with its legal counsel, has determined that such Stock Awards are otherwise exempt from or alternatively comply with the distribution requirements of Section 409A of the Code.

(b) **Ten Percent Stockholders.** A Ten Percent Stockholder will not be granted an Incentive Stock Option unless the exercise price of such Option is at least 110% of the Fair Market Value on the date of grant and the Option is not exercisable after the expiration of five years from the date of grant.

V. PROVISIONS RELATING TO OPTIONS AND STOCK APPRECIATION RIGHTS.

Each Option or SAR will be in such form and will contain such terms and conditions as the Board deems appropriate. All Options will be separately designated Incentive Stock Options or Nonstatutory Stock Options at the time of grant, and, if certificates are issued, a separate certificate or certificates will be issued for shares of Common Stock purchased on exercise of each type of Option. If an Option is not specifically designated as an Incentive Stock Option, or if an Option is designated as an Incentive Stock Option but some portion or all of the Option fails to qualify as an Incentive Stock Option under the applicable rules, then the Option (or portion thereof) will be a Nonstatutory Stock Option. The provisions of separate Options or SARs need not be identical; *provided, however*, that each Stock Award Agreement will conform to (through incorporation of provisions hereof by reference in the applicable Stock Award Agreement or otherwise) the substance of each of the following provisions:

(a) **Term.** Subject to the provisions of Section 4(b) regarding Ten Percent Stockholders, no Option or SAR will be exercisable after the expiration of ten (10) years from the date of its grant or such shorter period specified in the Stock Award Agreement.

(b) **Exercise Price.** Subject to the provisions of Section 4(b) regarding Ten Percent Stockholders, the exercise or strike price of each Option or SAR will be not less than 100% of the Fair Market Value of the Common Stock subject to the Option or SAR on the date the Stock Award is granted. Notwithstanding the foregoing, an Option or SAR may be granted with an exercise or strike price lower than 100% of the Fair Market Value of the Common Stock subject to the Stock Award if such Stock Award is granted pursuant to an assumption of or substitution for another option or stock appreciation right pursuant to a Corporate Transaction and in a manner consistent with the provisions of Section 409A of the Code and, if applicable, Section 424(a) of the Code. Each SAR will be denominated in shares of Common Stock equivalents.

(c) **Purchase Price for Options.** The purchase price of Common Stock acquired pursuant to the exercise of an Option may be paid, to the extent permitted by applicable law and as determined by the Board in its sole discretion, by any combination of the methods of payment set forth below. The Board will have the authority to grant Options that do not permit all of the following methods of payment (or that otherwise restrict the ability to use certain methods) and to grant Options that require the consent of the Company to use a particular method of payment. The permitted methods of payment are as follows:

(i) by cash, check, bank draft or money order payable to the Company;

(ii) pursuant to a program developed under Regulation T as promulgated by the Federal Reserve Board that, prior to the issuance of the Common Stock subject to the Option, results in either the receipt of cash (or check) by the Company or the receipt of irrevocable instructions to pay the aggregate exercise price to the Company from the sales proceeds;

(iii) by delivery to the Company (either by actual delivery or attestation) of shares of Common Stock;

(iv) if an Option is a Nonstatutory Stock Option, by a "net exercise" arrangement pursuant to which the Company will reduce the number of shares of Common Stock issuable upon exercise by the largest whole number of shares with a Fair Market Value that does not exceed the aggregate exercise price; *provided, however*, that the Company will accept a cash or other payment from the Participant to the extent of any remaining balance of the aggregate exercise price not satisfied by such reduction in the number of whole shares to be issued. Shares of Common Stock will no longer be subject to an Option and will not be exercisable thereafter to the extent that (A) shares issuable upon exercise are used to pay the exercise price pursuant to the "net exercise," (B) shares are delivered to the Participant as a result of such exercise, and (C) shares are withheld to satisfy tax withholding obligations; or

(v) in any other form of legal consideration that may be acceptable to the Board and specified in the applicable Stock Award Agreement.

(d) **Exercise and Payment of a SAR.** To exercise any outstanding SAR, the Participant must provide written notice of exercise to the Company in compliance with the provisions of the Stock Award Agreement evidencing such SAR. The appreciation distribution payable on the exercise of a SAR will be not greater than an amount equal to the excess of (A) the aggregate Fair Market Value (on the date of the exercise of the SAR) of a number of shares of Common Stock equal to the number of Common Stock equivalents in which the Participant is vested under such SAR, and with respect to which the Participant is exercising the SAR on such date, over (B) the aggregate strike price of the number of Common Stock equivalents with respect to which the Participant is exercising the SAR on such date. The appreciation distribution may be paid in Common Stock, in cash, in any combination of the two or in any other form of consideration, as determined by the Board and contained in the Stock Award Agreement evidencing such SAR.

(e) **Transferability of Options and SARs.** The Board may, in its sole discretion, impose such limitations on the transferability of Options and SARs as the Board may determine. In the absence of such a determination by the Board to the contrary, the restrictions set forth in this Section 5(e) on the transferability of Options and SARs will apply. Notwithstanding the foregoing or anything in the Plan or a Stock Award Agreement to the contrary, no Option or SAR may be transferred to any financial institution without prior stockholder approval.

(i) **Restrictions on Transfer.** An Option or SAR will not be transferable except by will or by the laws of descent and distribution (and pursuant to Sections 5(e)(ii) and 5(e)(iii) below) and will be exercisable during the lifetime of the Participant only by the Participant. Subject to the foregoing paragraph, the Board may permit transfer of the Option or SAR in a manner that is not prohibited by applicable tax and securities laws. Except as explicitly provided in the Plan, neither an Option nor a SAR may be transferred for consideration.

(ii) **Domestic Relations Orders.** Subject to the approval of the Board or a duly authorized Officer, an Option or SAR may be transferred pursuant to the terms of a domestic relations order, official marital settlement agreement or other divorce or separation instrument as permitted by Treasury Regulations Section 1.421-1(b)(2). If an Option is an Incentive Stock Option, such Option may be deemed to be a Nonstatutory Stock Option as a result of such transfer.

(iii) **Beneficiary Designation.** Subject to the approval of the Board or a duly authorized Officer, a Participant may, by delivering written notice to the Company, in a form approved by the Company (or the designated broker), designate a third party who, upon the death of the Participant, will thereafter be entitled to exercise the Option or SAR and receive the Common Stock or other consideration resulting from such exercise. In the absence of such a designation, upon the death of the Participant, the executor or administrator of the Participant's estate will be entitled to exercise the Option or SAR and receive the Common Stock or other consideration resulting from such exercise. However, the Company may prohibit designation of a beneficiary at any time, including due to any conclusion by the Company that such designation would be inconsistent with the provisions of applicable laws.

(f) Vesting Generally. The total number of shares of Common Stock subject to an Option or SAR may vest and become exercisable in periodic installments that may or may not be equal. The Option or SAR may be subject to such other terms and conditions on the time or times when it may or may not be exercised (which may be based on the satisfaction of Performance Goals or other criteria) as the Board may deem appropriate. The vesting provisions of individual Options or SARs may vary. The provisions of this Section 5(f) are subject to any Option or SAR provisions governing the minimum number of shares of Common Stock as to which an Option or SAR may be exercised.

(g) Termination of Continuous Service. Except as otherwise provided in the applicable Stock Award Agreement or other agreement between the Participant and the Company or an Affiliate, if a Participant's Continuous Service terminates (other than for Cause and other than upon the Participant's death or Disability), the Participant may exercise his or her Option or SAR (to the extent that the Participant was entitled to exercise such Option or SAR as of the date of termination of Continuous Service), but only within such period of time ending on the earlier of (i) the date three months following such termination of Continuous Service (or such longer or shorter period specified in the Stock Award Agreement), and (ii) the expiration of the term of the Option or SAR as set forth in the Stock Award Agreement. If, after termination of Continuous Service, the Participant does not exercise his or her Option or SAR (as applicable) within the applicable time frame, the Option or SAR (as applicable) will terminate.

(h) Extension of Termination Date. Except as otherwise provided in the applicable Stock Award Agreement or other agreement between the Participant and the Company or an Affiliate, if the exercise of an Option or SAR following the termination of the Participant's Continuous Service (other than for Cause and other than upon the Participant's death or Disability) would be prohibited at any time solely because the issuance of shares of Common Stock would violate the registration requirements under the Securities Act, then the Option or SAR will terminate on the earlier of (i) the expiration of a total period of time (that need not be consecutive) equal to the applicable post-termination exercise period after the termination of the Participant's Continuous Service during which the exercise of the Option or SAR would not be in violation of such registration requirements, or (ii) the expiration of the term of the Option or SAR as set forth in the applicable Stock Award Agreement. In addition, unless otherwise provided in a Participant's Stock Award Agreement, if the sale of any Common Stock received upon exercise of an Option or SAR following the termination of the Participant's Continuous Service (other than for Cause) would violate the Company's insider trading policy, then the Option or SAR will terminate on the earlier

of (i) the expiration of a period of time (that need not be consecutive) equal to the applicable post-termination exercise period after the termination of the Participant's Continuous Service during which the sale of the Common Stock received upon exercise of the Option or SAR would not be in violation of the Company's insider trading policy, or (ii) the expiration of the term of the Option or SAR as set forth in the applicable Stock Award Agreement.

(i) **Disability of Participant.** Except as otherwise provided in the applicable Stock Award Agreement or other agreement between the Participant and the Company or an Affiliate, if a Participant's Continuous Service terminates as a result of the Participant's Disability, the Participant may exercise his or her Option or SAR (to the extent that the Participant was entitled to exercise such Option or SAR as of the date of termination of Continuous Service), but only within such period of time ending on the earlier of (i) the date 24 months following such termination of Continuous Service (or such longer or shorter period specified in the Stock Award Agreement), and (ii) the expiration of the term of the Option or SAR as set forth in the Stock Award Agreement. If, after termination of Continuous Service, the Participant does not exercise his or her Option or SAR (as applicable) within the applicable time frame, the Option or SAR (as applicable) will terminate.

(j) **Death of Participant.** Except as otherwise provided in the applicable Stock Award Agreement or other agreement between the Participant and the Company or an Affiliate, if (i) a Participant's Continuous Service terminates as a result of the Participant's death, or (ii) the Participant dies within the period (if any) specified in the Stock Award Agreement for exercisability after the termination of the Participant's Continuous Service (for a reason other than death), then the Participant's Option or SAR may be exercised (to the extent that the Participant was entitled to exercise such Option or SAR as of the date of death) by the Participant's estate, by a person who acquired the right to exercise the Option or SAR by bequest or inheritance or by a person designated to exercise the Option or SAR upon the Participant's death, but only within such period of time ending on the earlier of (i) the date 24 months following the date of death (or such longer or shorter period specified in the Stock Award Agreement), and (ii) the expiration of the term of such Option or SAR as set forth in the Stock Award Agreement. If, after the Participant's death, the Option or SAR (as applicable) is not exercised within the applicable time frame, the Option or SAR (as applicable) will terminate.

(k) **Termination for Cause.** Except as explicitly provided otherwise in a Participant's Stock Award Agreement or other individual written agreement between the Participant and the Company or an Affiliate, if a Participant's Continuous Service is terminated for Cause, the Participant's Option or SAR will terminate immediately upon such termination of Continuous Service, and the Participant will be prohibited from exercising his or her Option or SAR from and after the time of such termination of Continuous Service.

(l) **Non-Exempt Employees.** If an Option or SAR is granted to an Employee who is a non-exempt employee for purposes of the Fair Labor Standards Act of 1938, as amended, the Option or SAR will not be first exercisable for any shares of Common Stock until at least six months following the date of grant of the Option or SAR (although the Stock Award may vest prior to such date). Consistent with the provisions of the Worker Economic Opportunity Act, (i) if such non-exempt employee dies or suffers a Disability, (ii) upon a Corporate Transaction in which such Option or SAR is not assumed, continued, or substituted, (iii) upon a Change in Control, or (iv) upon the Participant's retirement (as such term may be defined in the Participant's Stock Award Agreement, in another agreement between the Participant and the Company or an Affiliate, or, if no such definition, in accordance with the Company's or Affiliate's then current employment policies and guidelines), the vested portion of any Options and SARs may be exercised earlier than six months following the date of grant. The foregoing provision is intended to operate so that any income derived by a non-exempt employee in connection with the exercise or vesting of an Option or SAR will be exempt from his or her regular rate of pay. To the extent permitted and/or required for compliance with the Worker Economic Opportunity Act to ensure that any income derived by a non-exempt employee in connection with the exercise, vesting or issuance of any shares under any other Stock Award will be exempt from the employee's regular rate of pay, the provisions of this Section 5(l) will apply to all Stock Awards and are hereby incorporated by reference into such Stock Award Agreements.

VI. PROVISIONS OF STOCK AWARDS OTHER THAN OPTIONS AND SARS.

(a) Restricted Stock Awards. Each Restricted Stock Award Agreement will be in such form and will contain such terms and conditions as the Board deems appropriate. To the extent consistent with the Company's bylaws, at the Board's election, shares of Common Stock underlying a Restricted Stock Award may be (i) held in book entry form subject to the Company's instructions until any restrictions relating to the Restricted Stock Award lapse, or (ii) evidenced by a certificate, which certificate will be held in such form and manner as determined by the Board. The terms and conditions of Restricted Stock Award Agreements may change from time to time, and the terms and conditions of separate Restricted Stock Award Agreements need not be identical. Each Restricted Stock Award Agreement will conform to (through incorporation of the provisions hereof by reference in the agreement or otherwise) the substance of each of the following provisions:

(i) Consideration. A Restricted Stock Award may be awarded in consideration for (A) cash, check, bank draft or money order payable to the Company, (B) past services to the Company or an Affiliate, or (C) any other form of legal consideration (including future services) that may be acceptable to the Board, in its sole discretion, and permissible under applicable law.

(ii) Vesting. Shares of Common Stock awarded under the Restricted Stock Award Agreement may be subject to forfeiture to the Company in accordance with a vesting schedule to be determined by the Board.

(iii) Termination of Participant's Continuous Service. If a Participant's Continuous Service terminates, the Company may receive through a forfeiture condition or a repurchase right any or all of the shares of Common Stock held by the Participant as of the date of termination of Continuous Service under the terms of the Restricted Stock Award Agreement.

(iv) Transferability. Rights to acquire shares of Common Stock under the Restricted Stock Award Agreement will be transferable by the Participant only upon such terms and conditions as are set forth in the Restricted Stock Award Agreement, as the Board will determine in its sole discretion, so long as Common Stock awarded under the Restricted Stock Award Agreement remains subject to the terms of the Restricted Stock Award Agreement. Notwithstanding the foregoing or anything in the Plan or a Restricted Stock Award Agreement to the contrary, no Restricted Stock Award may be transferred to any financial institution without prior stockholder approval.

(b) Restricted Stock Unit Awards. Each Restricted Stock Unit Award Agreement will be in such form and will contain such terms and conditions as the Board deems appropriate. The terms and conditions of Restricted Stock Unit Award Agreements may change from time to time, and the terms and conditions of separate Restricted Stock Unit Award Agreements need not be identical. Each Restricted Stock Unit Award Agreement will conform to (through incorporation of the provisions hereof by reference in the agreement or otherwise) the substance of each of the following provisions:

(i) Consideration. At the time of grant of a Restricted Stock Unit Award, the Board will determine the consideration, if any, to be paid by the Participant upon delivery of each share of Common Stock subject to the Restricted Stock Unit Award. The consideration to be paid (if any) by the Participant for each share of Common Stock subject to a Restricted Stock Unit Award may be paid in any form of legal consideration that may be acceptable to the Board, in its sole discretion, and permissible under applicable law.

(ii) Vesting. At the time of the grant of a Restricted Stock Unit Award, the Board may impose such restrictions on or conditions to the vesting of the Restricted Stock Unit Award as it, in its sole discretion, deems appropriate.

(iii) Payment. A Restricted Stock Unit Award may be settled by the delivery of shares of Common Stock, their cash equivalent, any combination thereof or in any other form of consideration, as determined by the Board and contained in the Restricted Stock Unit Award Agreement.

(iv) Additional Restrictions. At the time of the grant of a Restricted Stock Unit Award, the Board, as it deems appropriate, may impose such restrictions or conditions that delay the delivery of the shares of Common Stock (or their cash equivalent) subject to a

Restricted Stock Unit Award to a time after the vesting of such Restricted Stock Unit Award.

(v) **Termination of Participant's Continuous Service.** Except as otherwise provided in the applicable Restricted Stock Unit Award Agreement, such portion of the Restricted Stock Unit Award that has not vested will be forfeited upon the Participant's termination of Continuous Service.

(c) **Performance Stock Awards.**

(i) **Performance Stock Awards.** A Performance Stock Award is a Stock Award that is payable (including that may be granted, vest or be exercised) contingent upon the attainment during a Performance Period of certain Performance Goals. A Performance Stock Award may, but need not, require the Participant's completion of a specified period of Continuous Service. The length of any Performance Period, the Performance Goals to be achieved during the Performance Period, and the measure of whether and to what degree such Performance Goals have been attained will be conclusively determined by the Board, in its sole discretion. In addition, to the extent permitted by applicable law and the applicable Stock Award Agreement, the Board may determine that cash may be used in payment of Performance Stock Awards.

(ii) **Board Discretion.** The Board retains the discretion to reduce or eliminate the compensation or economic benefit due upon the attainment of any Performance Goals and to define the manner of calculating the Performance Criteria it selects to use for a Performance Period.

(d) **Other Stock Awards.** Other forms of Stock Awards valued in whole or in part by reference to, or otherwise based on, Common Stock, including the appreciation in value thereof (*e.g.*, options or stock appreciation rights with an exercise price or strike price less than 100% of the Fair Market Value of the Common Stock at the time of grant) may be granted either alone or in addition to Stock Awards granted under Section 5 and this Section 6. Subject to the provisions of the Plan (including, but not limited to, Section 2(g)), the Board will have sole and complete authority to determine the persons to whom and the time or times at which such Other Stock Awards will be granted, the number of shares of Common Stock (or the cash equivalent thereof) to be granted pursuant to such Other Stock Awards and all other terms and conditions of such Other Stock Awards.

VII. COVENANTS OF THE COMPANY.

(a) **Availability of Shares.** The Company will keep available at all times the number of shares of Common Stock reasonably required to satisfy then-outstanding Stock Awards.

(b) **Securities Law Compliance.** The Company will seek to obtain from each regulatory commission or agency having jurisdiction over the Plan the authority required to grant Stock Awards and to issue and sell shares of Common Stock upon exercise of the Stock Awards; *provided, however*, that this undertaking will not require the Company to register under the Securities Act the Plan, any Stock Award or any Common Stock issued or issuable pursuant to any such Stock Award. If, after reasonable efforts and at a reasonable cost, the Company is unable to obtain from any such regulatory commission or agency the authority that counsel for the Company deems necessary for the lawful issuance and sale of Common Stock under the Plan, the Company will be relieved from any liability for failure to issue and sell Common Stock upon exercise of such Stock Awards unless and until such authority is obtained. A Participant will not be eligible for the grant of a Stock Award or the subsequent issuance of cash or Common Stock pursuant to the Stock Award if such grant or issuance would be in violation of any applicable securities law.

(c) **No Obligation to Notify or Minimize Taxes.** The Company will have no duty or obligation to any Participant to advise such holder as to the time or manner of exercising a Stock Award. Furthermore, the Company will have no duty or obligation to warn or otherwise advise such holder of a pending termination or expiration of a Stock Award or a possible period in which the Stock Award may not be exercised. The Company has no duty or obligation to minimize the tax consequences of a Stock Award to the holder of such Stock Award.

VIII. MISCELLANEOUS.

(a) Use of Proceeds from Sales of Common Stock. Proceeds from the sale of shares of Common Stock issued pursuant to Stock Awards will constitute general funds of the Company.

(b) Corporate Action Constituting Grant of Stock Awards. Corporate action constituting a grant by the Company of a Stock Award to any Participant will be deemed completed as of the date of such corporate action, unless otherwise determined by the Board, regardless of when the instrument, certificate, or letter evidencing the Stock Award is communicated to, or actually received or accepted by, the Participant. In the event that the corporate records (*e.g.*, Board consents, resolutions or minutes) documenting the corporate action constituting the grant contain terms (*e.g.*, exercise price, vesting schedule or number of shares) that are inconsistent with those in the Stock Award Agreement or related grant documents as a result of a clerical error in the preparation of the Stock Award Agreement or related grant documents, the corporate records will control and the Participant will have no legally binding right to the incorrect terms in the Stock Award Agreement or related grant documents.

(c) Stockholder Rights. No Participant will be deemed to be the holder of, or to have any of the rights of a holder with respect to, any shares of Common Stock subject to a Stock Award unless and until (i) such Participant has satisfied all requirements for exercise of, or the issuance of shares of Common Stock under, the Stock Award pursuant to its terms, and (ii) the issuance of the Common Stock subject to such Stock Award has been entered into the books and records of the Company.

(d) No Employment or Other Service Rights. Nothing in the Plan, any Stock Award Agreement or any other instrument executed thereunder or in connection with any Stock Award granted pursuant thereto will confer upon any Participant any right to continue to serve the Company or an Affiliate in the capacity in effect at the time the Stock Award was granted or will affect the right of the Company or an Affiliate to terminate (i) the employment of an Employee with or without notice and with or without cause, (ii) the service of a Consultant pursuant to the terms of such Consultant's agreement with the Company or an Affiliate, or (iii) the service of a Director pursuant to the bylaws of the Company or an Affiliate, and any applicable provisions of the corporate law of the state in which the Company or the Affiliate is incorporated, as the case may be.

(e) Change in Time Commitment. In the event a Participant's regular level of time commitment in the performance of his or her services for the Company or any Affiliate is reduced (for example, and without limitation, if the Participant is an Employee of the Company and the Employee has a change in status from a full-time Employee to a part-time Employee) after the date of grant of any Stock Award to the Participant, the Board has the right in its sole discretion to (x) make a corresponding reduction in the number of shares or cash amount subject to any portion of such Stock Award that is scheduled to vest or become payable after the date of such change in time commitment, and (y) in lieu of or in combination with such a reduction, extend the vesting or payment schedule applicable to such Stock Award. In the event of any such reduction, the Participant will have no right with respect to any portion of the Stock Award that is so reduced or extended.

(f) Incentive Stock Option Limitations. To the extent that the aggregate Fair Market Value (determined at the time of grant) of Common Stock with respect to which Incentive Stock Options are exercisable for the first time by any Optionholder during any calendar year (under all plans of the Company and any Affiliates) exceeds $100,000 (or such other limit established in the Code) or otherwise does not comply with the rules governing Incentive Stock Options, the Options or portions thereof that exceed such limit (according to the order in which they were granted) or otherwise do not comply with such rules will be treated as Nonstatutory Stock Options, notwithstanding any contrary provision of the applicable Option Agreement(s).

(g) Investment Assurances. The Company may require a Participant, as a condition of exercising or acquiring Common Stock under any Stock Award, (i) to give written assurances satisfactory to the Company as to the Participant's knowledge and experience in financial and business matters and/or to employ a purchaser representative reasonably satisfactory to the Company who is knowledgeable and experienced in financial and business matters and that they are capable of evaluating, alone or together with the purchaser representative, the merits and risks of exercising the Stock Award; and (ii) to give written assurances satisfactory to the Company stating that the Participant is acquiring Common Stock subject to the Stock Award for the Participant's own account and not with any present intention of selling or otherwise distributing the Common Stock. The foregoing

requirements, and any assurances given pursuant to such requirements, will be inoperative if (A) the issuance of the shares upon the exercise or acquisition of Common Stock under the Stock Award has been registered under a then currently effective registration statement under the Securities Act, or (B) as to any particular requirement, a determination is made by counsel for the Company that such requirement need not be met in the circumstances under the then applicable securities laws. The Company may, upon advice of counsel to the Company, place legends on stock certificates issued under the Plan as such counsel deems necessary or appropriate in order to comply with applicable securities laws, including, but not limited to, legends restricting the transfer of the Common Stock.

(h) **Withholding Obligations.** Unless prohibited by the terms of a Stock Award Agreement, the Company may, in its sole discretion, satisfy any federal, state or local tax withholding obligation relating to a Stock Award by any of the following means or by a combination of such means: (i) causing the Participant to tender a cash payment; (ii) withholding shares of Common Stock from the shares of Common Stock issued or otherwise issuable to the Participant in connection with the Stock Award; *provided, however,* that no shares of Common Stock are withheld with a value exceeding the maximum amount of tax that may be required to be withheld by law (or such other amount as may be permitted while still avoiding classification of the Stock Award as a liability for financial accounting purposes); (iii) withholding cash from a Stock Award settled in cash; (iv) withholding payment from any amounts otherwise payable to the Participant; or (v) by such other method as may be set forth in the Stock Award Agreement.

(i) **Electronic Delivery.** Any reference herein to a "written" agreement or document will include any agreement or document delivered electronically, filed publicly at www.sec.gov (or any successor website thereto) or posted on the Company's intranet (or other shared electronic medium controlled by the Company to which the Participant has access).

(j) **Deferrals.** To the extent permitted by applicable law, the Board, in its sole discretion, may determine that the delivery of Common Stock or the payment of cash, upon the exercise, vesting or settlement of all or a portion of any Stock Award may be deferred and may establish programs and procedures for deferral elections to be made by Participants. Deferrals by Participants will be made in accordance with Section 409A of the Code. Consistent with Section 409A of the Code, the Board may provide for distributions while a Participant is still an employee or otherwise providing services to the Company or an Affiliate. The Board is authorized to make deferrals of Stock Awards and determine when, and in what annual percentages, Participants may receive payments, including lump sum payments, following the Participant's termination of Continuous Service, and implement such other terms and conditions consistent with the provisions of the Plan and in accordance with applicable law.

(k) **Compliance with Section 409A of the Code.** Unless otherwise expressly provided for in a Stock Award Agreement, the Plan and Stock Award Agreements will be interpreted to the greatest extent possible in a manner that makes the Plan and the Stock Awards granted hereunder exempt from Section 409A of the Code, and, to the extent not so exempt, in compliance with Section 409A of the Code. To the extent that the Board determines that any Stock Award granted hereunder is not exempt from and is therefore subject to Section 409A of the Code, the Stock Award Agreement evidencing such Stock Award will incorporate the terms and conditions necessary to avoid the consequences specified in Section 409A(a)(1) of the Code, and, to the extent applicable, the Plan and Stock Award Agreements will be interpreted in accordance with the requirements of Section 409A of the Code. Notwithstanding anything to the contrary in this Plan (and unless the Stock Award Agreement specifically provides otherwise), if the shares of Common Stock are publicly traded and a Participant holding a Stock Award that constitutes "deferred compensation" under Section 409A of the Code is a "specified employee" for purposes of Section 409A of the Code, no distribution or payment of any amount will be made upon a "separation from service" before a date that is six months following the date of such Participant's "separation from service" (as defined in Section 409A of the Code without regard to alternative definitions thereunder) or, if earlier, the date of the Participant's death.

(l) **Clawback/Recovery.** All Stock Awards granted under the Plan will be subject to recoupment in accordance with any clawback provisions in a Participant's employment agreement or other agreement with the Company or any clawback policy that the Company is required to adopt pursuant to the listing standards of any national securities exchange or association on which the Company's securities are listed or as is otherwise required by the Dodd-Frank Wall Street Reform

and Consumer Protection Act or other applicable law. In addition, the Board may impose such other clawback, recovery or recoupment provisions in a Stock Award Agreement as the Board determines necessary or appropriate, including but not limited to a reacquisition right in respect of previously acquired shares of Common Stock or other cash or property upon the occurrence of Cause. No recovery of compensation under such a clawback policy will be an event giving rise to a right to resign for "good reason" or "constructive termination" (or similar term) under any agreement with the Company or an Affiliate.

IX. ADJUSTMENTS UPON CHANGES IN COMMON STOCK; OTHER CORPORATE EVENTS.

(a) Capitalization Adjustments. In the event of a Capitalization Adjustment, the Board will appropriately and proportionately adjust: (i) the class(es) and maximum number of securities subject to the Plan pursuant to Section 3(a), (ii) the class(es) and maximum number of securities that may be issued pursuant to the exercise of Incentive Stock Options pursuant to Section 3(c), and (iii) the class(es) and number of securities and price per share of stock subject to outstanding Stock Awards. The Board will make such adjustments, and its determination will be final, binding and conclusive.

(b) Dissolution or Liquidation. Except as otherwise provided in the Stock Award Agreement, in the event of a dissolution or liquidation of the Company, all outstanding Stock Awards (other than Stock Awards consisting of vested and outstanding shares of Common Stock not subject to a forfeiture condition or the Company's right of repurchase) will terminate immediately prior to the completion of such dissolution or liquidation, and the shares of Common Stock subject to the Company's repurchase rights or subject to a forfeiture condition may be repurchased or reacquired by the Company notwithstanding the fact that the holder of such Stock Award is providing Continuous Service, *provided, however*, that the Board may, in its sole discretion, cause some or all Stock Awards to become fully vested, exercisable and/or no longer subject to repurchase or forfeiture (to the extent such Stock Awards have not previously expired or terminated) before the dissolution or liquidation is completed but contingent on its completion.

(c) Corporate Transaction. The following provisions will apply to Stock Awards in the event of a Corporate Transaction unless otherwise provided in the Stock Award Agreement or any other written agreement between the Company or any Affiliate and the Participant or unless otherwise expressly provided by the Board at the time of grant of a Stock Award. In the event of a Corporate Transaction, then, notwithstanding any other provision of the Plan, the Board may take one or more of the following actions with respect to Stock Awards, contingent upon the closing or completion of the Corporate Transaction:

(i) arrange for the surviving corporation or acquiring corporation (or the surviving or acquiring corporation's parent company) to assume or continue the Stock Award or to substitute a similar stock award for the Stock Award (including, but not limited to, an award to acquire the same consideration paid to the stockholders of the Company pursuant to the Corporate Transaction);

(ii) arrange for the assignment of any reacquisition or repurchase rights held by the Company in respect of Common Stock issued pursuant to the Stock Award to the surviving corporation or acquiring corporation (or the surviving or acquiring corporation's parent company);

(iii) accelerate the vesting, in whole or in part, of the Stock Award (and, if applicable, the time at which the Stock Award may be exercised) to a date prior to the effective time of such Corporate Transaction as the Board determines (or, if the Board does not determine such a date, to the date that is five (5) days prior to the effective date of the Corporate Transaction), with such Stock Award terminating if not exercised (if applicable) at or prior to the effective time of the Corporate Transaction; *provided, however*, that the Board may require Participants to complete and deliver to the Company a notice of exercise before the effective date of a Corporate Transaction, which exercise is contingent upon the effectiveness of such Corporate Transaction;

(iv) arrange for the lapse, in whole or in part, of any reacquisition or repurchase rights held by the Company with respect to the Stock Award;

(v) cancel or arrange for the cancellation of the Stock Award, to the extent not vested or not exercised prior to the effective time of the Corporate Transaction, in exchange for

such cash consideration, if any, as the Board, in its sole discretion, may consider appropriate; and

(vi) make a payment, in such form as may be determined by the Board equal to the excess, if any, of (A) the value of the property the Participant would have received upon the exercise of the Stock Award immediately prior to the effective time of the Corporate Transaction, over (B) any exercise price payable by such holder in connection with such exercise. For clarity, this payment may be zero ($0) if the value of the property is equal to or less than the exercise price. Payments under this provision may be delayed to the same extent that payment of consideration to the holders of the Company's Common Stock in connection with the Corporate Transaction is delayed as a result of escrows, earn outs, holdbacks or any other contingencies.

The Board need not take the same action or actions with respect to all Stock Awards or portions thereof or with respect to all Participants. The Board may take different actions with respect to the vested and unvested portions of a Stock Award.

(d) Change in Control. A Stock Award may be subject to additional acceleration of vesting and exercisability upon or after a Change in Control as may be provided in the Stock Award Agreement for such Stock Award or as may be provided in any other written agreement between the Company or any Affiliate and the Participant, but in the absence of such provision, no such acceleration will occur.

X. TERMINATION OR SUSPENSION OF THE PLAN.

(a) The Board may suspend or terminate the Plan at any time. No Incentive Stock Option will be granted after the tenth anniversary of the earlier of (i) the date the Plan is adopted by the Board, or (ii) the date the Plan is approved by the stockholders of the Company. No Stock Awards may be granted under the Plan while the Plan is suspended or after it is terminated.

(b) No Impairment of Rights. Suspension or termination of the Plan will not materially impair rights and obligations under any Stock Award granted while the Plan is in effect except with the written consent of the affected Participant or as otherwise permitted in the Plan.

XI. EFFECTIVE DATE OF PLAN.

This Plan will become effective on the Effective Date.

XII. CHOICE OF LAW.

The laws of the State of Delaware will govern all questions concerning the construction, validity and interpretation of this Plan, without regard to that state's conflict of laws rules.

(a) DEFINITIONS. As used in the Plan, the following definitions will apply to the capitalized terms indicated below:

(b) "***Affiliate***" means, at the time of determination, any "parent" or "subsidiary" of the Company as such terms are defined in Rule 405. The Board will have the authority to determine the time or times at which "parent" or "subsidiary" status is determined within the foregoing definition.

(c) "***Board***" means the Board of Directors of the Company.

(d) "***Capitalization Adjustment***" means any change that is made in, or other events that occur with respect to, the Common Stock subject to the Plan or subject to any Stock Award after the Effective Date without the receipt of consideration by the Company through merger, consolidation, reorganization, recapitalization, reincorporation, stock dividend, dividend in property other than cash, large nonrecurring cash dividend, stock split, reverse stock split, liquidating dividend, combination of shares, exchange of shares, change in corporate structure or any similar equity restructuring transaction, as that term is used in Statement of Financial Accounting Standards Board Accounting Standards Codification Topic 718 (or any successor thereto). Notwithstanding the foregoing, the conversion of any convertible securities of the Company will not be treated as a Capitalization Adjustment.

(e) "***Cause***" will have the meaning ascribed to such term in any written agreement between the Participant and the Company or an Affiliate defining such term and, in the absence of such agreement, such term will mean, with respect to a Participant and for purposes of the application of this Plan, the occurrence of any of the following events: (i) such Participant's conviction of, or plea of no contest with respect to, any crime involving fraud, dishonesty or moral turpitude; (ii) such Participant's attempted commission of or participation in a fraud or act of dishonesty against the Company or an Affiliate that results in (or might have reasonably resulted in) material harm to the business of the Company or an Affiliate; (iii) such Participant's intentional, material violation of any contract or agreement between the Participant and the Company or an Affiliate, or any statutory duty the Participant owes to the Company or an Affiliate; or (iv) such Participant's conduct that constitutes gross misconduct, insubordination, incompetence or habitual neglect of duties and that results in (or might have reasonably resulted in) material harm to the business of the Company or an Affiliate. The determination that a termination of the Participant's Continuous Service is either for Cause or without Cause will be made by the Company, in its sole discretion. Any determination by the Company that the Continuous Service of a Participant was terminated with or without Cause for the purposes of outstanding Stock Awards held by such Participant will have no effect upon any determination of the rights or obligations of the Company or an Affiliate or such Participant for any other purpose.

(f) "***Change in Control***" will be deemed to have occurred upon the first to occur of an event set forth in any one of the following paragraphs:

(i) As a result of any merger or consolidation, the voting securities of the Company outstanding immediately prior thereto represent (either by remaining outstanding or by being converted into voting securities of the surviving or acquiring entity) less than 49% of the combined voting power of the voting securities of the Company or such surviving or acquiring entity outstanding immediately after such merger or consolidation;

(ii) during any period of 24 consecutive calendar months, the individuals who at the beginning of such period constitute the Board, and any new directors whose election by such Board or nomination for election by stockholders was approved by a vote of at least two-thirds of the members of such Board who were either directors on such Board at the beginning of the period or whose election or nomination for election as directors was previously so approved, for any reason cease to constitute at least a majority of the members thereof;

(iii) any individual, entity or group (within the meaning of Section 13(d)(3) or 14(d)(2) of the Exchange Act) shall become the beneficial owner (within the meaning of Rule 13d-3 promulgated under the Exchange Act) of more than 20% of the then outstanding shares of Common Stock of the Company;

(iv) any sale of all or substantially all of the assets of the Company; or

(v) the complete liquidation or dissolution of the Company.

Notwithstanding the foregoing, if a Change in Control constitutes a payment event with respect to any Stock Award which provides for the deferral of compensation and is subject to Section 409A of the Code, the transaction or event with respect to such Stock Award must also constitute a "change in control event," as defined in Treasury Regulation §1.409A-3(i)(5) to the extent required by Section 409A.

The Committee shall have full and final authority, which shall be exercised in its discretion, to determine conclusively whether a Change in Control of the Company has occurred pursuant to the above definition, and the date of the occurrence of such Change in Control and any incidental matters relating thereto.

Notwithstanding the foregoing, a Change in Control shall not be deemed to occur solely because the threshold voting power of the Company's then outstanding securities in Section 13(e)(i) or (iii) is acquired by (A) a trustee or other fiduciary holding securities under one or more employee benefit plans maintained by the Company or any of its subsidiaries or (B) any corporation which, immediately prior to such acquisition, is owned directly or indirectly by the stockholders of the Company in the same proportion as their ownership of stock in the Company immediately prior to such acquisition.

For the avoidance of doubt, the term Change in Control shall not include a sale of assets, merger or other transaction effected exclusively for the purpose of changing the domicile of the Company.

Notwithstanding the foregoing or any other provision of this Plan, the definition of Change in Control (or any analogous term) in an individual written agreement between the Company or any Affiliate and the Participant shall supersede the foregoing definition with respect to Stock Awards subject to such agreement; provided, however, that if no definition of Change in Control or any analogous term is set forth in such an individual written agreement, the foregoing definition shall apply.

(f) "***Code***" means the Internal Revenue Code of 1986, as amended, including any applicable regulations and guidance thereunder.

(g) "***Committee***" means a committee of one or more Directors to whom authority has been delegated by the Board in accordance with Section 2(c).

(h) "***Common Stock***" means the common stock of the Company.

(i) "***Company***" means Geron Corporation, a Delaware corporation.

(j) "***Consultant***" means any person, including an advisor, who is (i) engaged by the Company or an Affiliate to render consulting or advisory services and is compensated for such services, or (ii) serving as a member of the board of directors of an Affiliate and is compensated for such services. However, service solely as a Director, or payment of a fee for such service, will not cause a Director to be considered a "Consultant" for purposes of the Plan. Notwithstanding the foregoing, a person is treated as a Consultant under this Plan only if a Form S-8 Registration Statement under the Securities Act is available to register either the offer or the sale of the Company's securities to such person.

(k) "***Continuous Service***" means that the Participant's service with the Company or an Affiliate, whether as an Employee, Director or Consultant, is not interrupted or terminated. A change in the capacity in which the Participant renders service to the Company or an Affiliate as an Employee, Director or Consultant or a change in the Entity for which the Participant renders such service, provided that there is no interruption or termination of the Participant's service with the Company or an Affiliate, will not terminate a Participant's Continuous Service; *provided, however,* that if the Entity for which a Participant is rendering services ceases to qualify as an Affiliate, as determined by the Board, in its sole discretion, such Participant's Continuous Service will be considered to have terminated on the date such Entity ceases to qualify as an Affiliate. For example, a change in status from an Employee of the Company to a Consultant of an Affiliate or to a Director will not constitute an interruption of Continuous Service. To the extent permitted by law, the Board or the chief executive officer of the Company, in that party's sole discretion, may determine whether Continuous Service will be considered interrupted in the case of (i) any leave of absence approved by the Board or chief executive officer, including sick leave, military leave or any other personal leave, or (ii) transfers between the Company, an Affiliate, or their successors. Notwithstanding the foregoing, a leave of absence will be treated as Continuous Service for purposes of vesting in a Stock Award only to such extent as may be provided in the Company's or Affiliate's leave of absence policy, in the written terms of any leave of absence agreement or policy applicable to the Participant, or as otherwise required by law.

(l) "***Corporate Transaction***" means the consummation, in a single transaction or in a series of related transactions, of any one or more of the following events:

(i) a sale, lease or other disposition of all or substantially all of the assets of the Company;

(ii) a sale or other disposition of at least ninety percent (90%) of the outstanding securities of the Company;

(iii) a merger, consolidation or similar transaction in which the Company is not the surviving corporation; or

(iv) a reverse merger, consolidation or similar transaction in which the Company is the surviving corporation but the shares of Common Stock outstanding immediately preceding the merger, consolidation or similar transaction are converted by virtue of the

merger, consolidation or similar transaction into other property, whether in the form of securities, cash or otherwise.

Notwithstanding the foregoing definition or any other provision of this Plan, the term Corporate Transaction will not include a sale of assets, merger or other transaction effected exclusively for the purpose of changing the domicile of the Company.

(m) "***Director***" means a member of the Board.

(n) "***Disability***" means, with respect to a Participant, the inability of such Participant to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or that has lasted or can be expected to last for a continuous period of not less than 12 months, as provided in Sections 22(e)(3) and 409A(a)(2)(c)(i) of the Code, and will be determined by the Board on the basis of such medical evidence as the Board deems warranted under the circumstances.

(o) "***Effective Date***" means the effective date of this Plan document, which is the date of the annual meeting of stockholders of the Company held in 2018, provided this Plan is approved by the Company's stockholders at such meeting.

(p) "***Employee***" means any person employed by the Company or an Affiliate. However, service solely as a Director, or payment of a fee for such services, will not cause a Director to be considered an "Employee" for purposes of the Plan.

(q) "***Entity***" means a corporation, partnership, limited liability company or other domestic or foreign entity.

(r) "***Exchange Act***" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

(s) "***Fair Market Value***" means, as of any date, the value of the Common Stock determined as follows:

(i) If the Common Stock is listed on any established stock exchange or traded on any established market, the Fair Market Value of a share of Common Stock will be, unless otherwise determined by the Board, the closing sales price for such stock as quoted on such exchange or market (or the exchange or market with the greatest volume of trading in the Common Stock) on the date of determination, as reported in a source the Board deems reliable.

(ii) Unless otherwise provided by the Board, if there is no closing sales price for the Common Stock on the date of determination, then the Fair Market Value will be the closing selling price on the last preceding date for which such quotation exists.

(iii) In the absence of such markets for the Common Stock, the Fair Market Value will be determined by the Board in good faith and in a manner that complies with Sections 409A and 422 of the Code.

(t) "***Full Value Award***" means any Stock Award granted under this Plan, other than an Option or SAR that has a per share exercise or strike price that is at least 100% of the Fair Market Value of the Common Stock on its original date of grant.

(u) "***Incentive Stock Option***" means an option granted pursuant to Section 5 that is intended to be, and that qualifies as, an "incentive stock option" within the meaning of Section 422 of the Code.

(v) "***Non-Employee Director***" means a Director who either (i) is not a current employee or officer of the Company or an Affiliate, does not receive compensation, either directly or indirectly, from the Company or an Affiliate for services rendered as a consultant or in any capacity other than as a Director (except for an amount as to which disclosure would not be required under Item 404(a) of Regulation S-K promulgated pursuant to the Securities Act ("***Regulation S-K***")), does not possess an interest in any other transaction for which disclosure would be required under Item 404(a) of Regulation S-K, and is not engaged in a business relationship for which disclosure would be required pursuant to Item 404(b) of Regulation S-K; or (ii) is otherwise considered a "non-employee director" for purposes of Rule 16b-3.

(w) "***Nonstatutory Stock Option***" means any option granted pursuant to Section 5 that does not qualify as an Incentive Stock Option.

(x) "***Officer***" means a person who is an officer of the Company within the meaning of Section 16 of the Exchange Act.

(y) "***Option***" means an Incentive Stock Option or a Nonstatutory Stock Option to purchase shares of Common Stock granted pursuant to the Plan.

(z) "***Option Agreement***" means a written agreement between the Company and an Optionholder evidencing the terms and conditions of an Option grant. Each Option Agreement will be subject to the terms and conditions of the Plan.

(aa) "***Optionholder***" means a person to whom an Option is granted pursuant to the Plan or, if applicable, such other person who holds an outstanding Option.

(bb) "***Other Stock Award***" means an award based in whole or in part by reference to the Common Stock which is granted pursuant to the terms and conditions of Section 6(d).

(cc) "***Other Stock Award Agreement***" means a written agreement between the Company and a holder of an Other Stock Award evidencing the terms and conditions of an Other Stock Award grant. Each Other Stock Award Agreement will be subject to the terms and conditions of the Plan.

(dd) "***Own,***" "***Owned,***" "***Owner,***" "***Ownership***" means a person or Entity will be deemed to "Own," to have "Owned," to be the "Owner" of, or to have acquired "Ownership" of securities if such person or Entity, directly or indirectly, through any contract, arrangement, understanding, relationship or otherwise, has or shares voting power, which includes the power to vote or to direct the voting, with respect to such securities.

(ee) "***Participant***" means a person to whom a Stock Award is granted pursuant to the Plan or, if applicable, such other person who holds an outstanding Stock Award.

(ff) "***Performance Criteria***" means the one or more criteria that the Board shall select for purposes of establishing the Performance Goals for a Performance Period. The Performance Criteria that shall be used to establish such Performance Goals may be based on any one of, or combination of, the following: (i) net earnings (either before or after one or more of the following: (A) interest, (B) taxes, (C) depreciation and (D) amortization); (ii) gross or net sales or revenue; (iii) net income (either before or after taxes); (iv) adjusted net income; (v) operating earnings or profit; (vi) cash flow (including, but not limited to, operating cash flow and free cash flow); (vii) return on assets; (viii) return on capital; (ix) return on stockholders' equity; (x) total stockholder return; (xi) return on sales; (xii) gross or net profit or operating margin; (xiii) costs; (xiv) funds from operations; (xv) expenses; (xvi) working capital; (xvii) earnings per share; (xviii) adjusted earnings per share; (xix) price per Share; (xx) regulatory body approval for commercialization of a product; (xxi) positive results from clinical trials; (xxii) initiation of clinical trials; (xxiii) implementation, completion or maintenance of critical projects or relationships; (xxiv) closing of significant financing; (xxv) execution or completion of strategic initiatives; (xxvi) market share; (xxvii) economic value; (xxviii) cash flow return on capital; (xxix) return on net assets; and (xxx) other measures of performance selected by the Board. Partial achievement of the specified criteria may result in the payment or vesting corresponding to the degree of achievement as specified in the Stock Award Agreement. The Board shall, in its sole discretion, define the manner of calculating the Performance Criteria it selects to use for such Performance Period.

(gg) "***Performance Goals***" means, for a Performance Period, the one or more goals established by the Board for the Performance Period based upon the Performance Criteria. Performance Goals may be based on a Company-wide basis, with respect to one or more business units, divisions, Affiliates, or business segments, and in either absolute terms or relative to the performance of one or more comparable companies or the performance of one or more relevant indices. The Board may, in its sole discretion, provide that one or more objectively determinable adjustments shall be made to one or more of the Performance Goals. Such adjustments may include one or more of the following: (i) items related to a change in accounting principle; (ii) items relating to financing activities; (iii) expenses for restructuring or productivity initiatives; (iv) other non-operating items; (v) items related to acquisitions; (vi) items attributable to the business operations of any entity acquired by the Company during the Performance Period; (vii) items related to the disposal of a business or segment of a business; (viii) items related to discontinued operations that do not qualify as a segment of a business under Applicable Accounting Standards; (ix) items attributable to any stock dividend, stock split, combination or exchange of stock occurring during the Performance Period; (x) any other items of significant income or expense which are determined to be appropriate

adjustments; (xi) items relating to unusual or extraordinary corporate transactions, events or developments, (xii) items related to amortization of acquired intangible assets; (xiii) items that are outside the scope of the Company's core, on-going business activities; (xiv) items related to acquired in-process research and development; (xv) items relating to changes in tax laws; (xvi) items relating to major licensing or partnership arrangements; (xvii) items relating to asset impairment charges; (xviii) items relating to gains or losses for litigation, arbitration and contractual settlements; (xix) items relating to any other unusual or nonrecurring events or changes in applicable laws, accounting principles or business conditions; or (xx) any other items selected by the Board.

(hh) "***Performance Period***" means the period of time selected by the Board over which the attainment of one or more Performance Goals will be measured for the purpose of determining a Participant's right to and the payment of a Performance Stock Award. Performance Periods may be of varying and overlapping duration, at the sole discretion of the Board.

(ii) "***Performance Stock Award***" means a Stock Award granted under the terms and conditions of Section 6(c)(i).

(jj) "***Plan***" means this Geron Corporation 2018 Equity Incentive Plan.

(kk) "***Restricted Stock Award***" means an award of shares of Common Stock which is granted pursuant to the terms and conditions of Section 6(a).

(ll) "***Restricted Stock Award Agreement***" means a written agreement between the Company and a holder of a Restricted Stock Award evidencing the terms and conditions of a Restricted Stock Award grant. Each Restricted Stock Award Agreement will be subject to the terms and conditions of the Plan.

(mm) "***Restricted Stock Unit Award***" means a right to receive shares of Common Stock which is granted pursuant to the terms and conditions of Section 6(b).

(nn) "***Restricted Stock Unit Award Agreement***" means a written agreement between the Company and a holder of a Restricted Stock Unit Award evidencing the terms and conditions of a Restricted Stock Unit Award grant. Each Restricted Stock Unit Award Agreement will be subject to the terms and conditions of the Plan.

(oo) "***Rule 16b-3***" means Rule 16b-3 promulgated under the Exchange Act or any successor to Rule 16b-3, as in effect from time to time.

(pp) "***Rule 405***" means Rule 405 promulgated under the Securities Act.

(qq) "***Securities Act***" means the Securities Act of 1933, as amended.

(rr) "***Stock Appreciation Right***" or "***SAR***" means a right to receive the appreciation on Common Stock that is granted pursuant to the terms and conditions of Section 5.

(ss) "***Stock Appreciation Right Agreement***" means a written agreement between the Company and a holder of a Stock Appreciation Right evidencing the terms and conditions of a Stock Appreciation Right grant. Each Stock Appreciation Right Agreement will be subject to the terms and conditions of the Plan.

(tt) "***Stock Award***" means any right to receive Common Stock granted under the Plan, including an Incentive Stock Option, a Nonstatutory Stock Option, a Stock Appreciation Right, a Restricted Stock Award, a Restricted Stock Unit Award, a Performance Stock Award or any Other Stock Award.

(uu) "***Stock Award Agreement***" means a written agreement between the Company and a Participant evidencing the terms and conditions of a Stock Award grant. Each Stock Award Agreement will be subject to the terms and conditions of the Plan.

(vv) "***Subsidiary***" means, with respect to the Company, (i) any corporation of which more than 50% of the outstanding capital stock having ordinary voting power to elect a majority of the board of directors of such corporation (irrespective of whether, at the time, stock of any other class or classes of such corporation will have or might have voting power by reason of the happening of any contingency) is at the time, directly or indirectly, Owned by the Company, and (ii) any partnership, limited liability company or other entity in which the Company has a direct or indirect interest (whether in the form of voting or participation in profits or capital contribution) of more than 50%.

(ww) "***Ten Percent Stockholder***" means a person who Owns (or is deemed to Own pursuant to Section 424(d) of the Code) stock possessing more than 10% of the total combined voting power of all classes of stock of the Company or any Affiliate.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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the Fiscal Year Ended December 31, 2022

or

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____ .

Commission File Number: 000-20859

GERON CORPORATION
(Exact name of registrant as specified in its charter)

Delaware	**75-2287752**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
919 East Hillsdale Blvd., Suite 250, Foster City, CA	**94404**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (650) 473-7700

Securities registered pursuant to Section 12(b) of the Act:

Title of each class:	**Trading symbol(s):**	**Name of each exchange on which registered:**
Common Stock, $0.001 par value	GERN	The Nasdaq Stock Market LLC

Securities registered pursuant to Section 12(g) of the Act: **None**

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒	Smaller reporting company	☒
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☐

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☒

The aggregate market value of voting and non-voting common equity held by non-affiliates of the registrant was approximately $503,187,000 based upon the closing price of the registrant's common stock on June 30, 2022 on the Nasdaq Global Select Market. The calculation of the aggregate market value of voting and non-voting common equity held by non-affiliates of the registrant excludes shares of common stock held by each officer, director and stockholder that the registrant concluded were affiliates on that date. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

As of March 9, 2023, there were 508,722,486 shares of common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE:

Document	**Form 10-K Parts**
Portions of the Registrant's definitive proxy statement for the 2023 annual meeting of stockholders to be filed pursuant to Regulation 14A within 120 days of the Registrant's fiscal year ended December 31, 2022.	III

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TABLE OF CONTENTS

In this report, unless otherwise indicated or the context otherwise requires, "Geron," "the registrant," "we," "us," and "our" refer to Geron Corporation, a Delaware corporation, and its wholly owned subsidiaries, Geron UK Limited, a United Kingdom company, and Geron Netherlands, B.V., a Dutch company.

Forward-Looking Statements

This annual report on Form 10-K, including "Business" in Part I, Item 1 of this annual report on Form 10-K and "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Part II, Item 7 of this annual report on Form 10-K, contains forward-looking statements that involve risks and uncertainties, as well as assumptions that, if they never materialize or prove incorrect, could cause the results of Geron Corporation, or Geron or the Company, to differ materially from those expressed or implied by such forward-looking statements. All statements other than statements of historical fact are statements that could be deemed forward-looking statements. In some cases, forward-looking statements can be identified by the use of terminology such as "may," "expects," "plans," "intends," "will," "should," "projects," "believes," "predicts," "anticipates," "estimates," "potential," or "continue" or the negative thereof or other comparable terminology. The risks and uncertainties referred to above include, without limitation, risks related to uncertainty of non-clinical and clinical trial results or regulatory approvals or clearances, the future development of imetelstat, including any future efficacy or safety results that may cause the benefit-risk profile of imetelstat to become unacceptable, our need for additional capital to support the development and commercialization of imetelstat and to otherwise grow our business, establishing and maintaining imetelstat manufacture and supply, enforcement of our patent and proprietary rights, managing our business growth, litigation risks, the effects of the COVID-19 pandemic or geopolitical events, potential competition and other risks that are described herein and that are otherwise described from time to time in our Securities and Exchange Commission reports including, but not limited to, the factors described in "Risk Factors," in Part I, Item 1A of this annual report on Form 10-K. Geron assumes no obligation for and except as required by law, disclaims any obligation to update these forward-looking statements to reflect future information, events or circumstances.

Risk Factor Summary

Below is a summary of material factors that make an investment in our common stock speculative or risky. Importantly, this summary does not address all of the risks and uncertainties that we face. You should understand that it is not possible to predict or identify all such factors. Consequently, you should not consider this summary to be a complete discussion of all potential risks or uncertainties that may substantially impact our business. Additional discussion of the risks and uncertainties summarized in this risk factor summary, as well as other risks and uncertainties that we face, can be found under "Risk Factors" in Part I, Item 1A of this annual report on Form 10-K. The summary below is qualified in its entirety by that more complete discussion of such risks and uncertainties. Moreover, we operate in a competitive and rapidly changing environment. New factors emerge from time to time and it is not possible to predict the impact of all of these factors on our business, financial condition or results of operations. You should consider carefully the risks and uncertainties described under "Risk Factors" in Part I, Item 1A of this annual report on Form 10-K as part of your evaluation of an investment in our common stock.

- We are wholly dependent on the success of our sole product candidate, imetelstat.
- If we fail to demonstrate sufficient safety and efficacy data from IMerge Phase 3 to the satisfaction of the U.S. Food and Drug Administration, or FDA, or similar international regulatory authorities, additional clinical testing may be required before we can seek regulatory approval for imetelstat in Low or Intermediate-1 risk myelodysplastic syndromes, or lower risk MDS, and begin commercialization, if at all, any of which could result in increased costs to us, delay or limit our ability to generate revenue and adversely affect our business and commercial prospects.
- Any suspension of or delays in IMpactMF, including due to the effects of macroeconomic conditions such the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates or prospects of a recession, could result in increased costs to us, delay or limit our ability to generate revenue and adversely affect our commercial prospects.
- Any termination of IMpactMF would have a material adverse effect on our business, business prospects and the future of imetelstat.
- Imetelstat may continue to cause, or have attributed to it, undesirable or unintended side effects or other adverse events that could further delay or prevent the commencement and/or completion of clinical trials for imetelstat, further delay or prevent its regulatory approval, or limit its commercial potential.

- If IMpactMF fails to demonstrate safety and effectiveness to the satisfaction of the FDA or similar regulatory authorities in other countries or does not otherwise produce positive results, we would incur additional costs, experience delays in completing or ultimately fail in completing the development and commercialization of imetelstat in patients with Intermediate-2 or High-Risk myelofibrosis who have relapsed after or are refractory to treatment with a janus associate kinase inhibitor, or JAK inhibitor, or relapsed/refractory MF, which would have a material adverse effect on our business, business prospects and the future of imetelstat.
- Clinical drug development involves a lengthy and expensive process with uncertain timelines and uncertain outcomes, and results of earlier stage clinical trials and non-clinical studies may not be predictive of future results.
- We rely on third parties to conduct our clinical trials and their failure to perform could have a material adverse effect on our business that might cause us to cease operations.
- Our failure to obtain regulatory approval for imetelstat in the United States, or U.S., would have a material adverse effect on our business that would likely cause us to cease operations.
- If imetelstat is approved for marketing and commercialization and we are unable to establish sales, marketing and distribution capabilities, or obtain coverage and adequate third-party payor reimbursement, we will be unable to successfully commercialize imetelstat.
- If we are not successful in commercializing imetelstat, we will not be able to achieve our projections for future revenue, if any.
- We rely on third parties to manufacture and supply imetelstat, and may be unable to ensure that we have adequate quantities of imetelstat that meet specifications that may be approved or required by regulatory authorities, and timelines necessary for current and potential future clinical trials and potential commercial uses.
- Regulatory inspections of third-party manufacturers may identify deficiencies in manufacturing processes or facilities which could impact the ability of third-party manufacturers to produce and deliver products, including imetelstat.
- The COVID-19 pandemic has affected and continues to affect our ability to conduct clinical trial activities, causing delays in IMpactMF, IMproveMF, and our investigator-led clinical trial, IMpress, in acute myeloid leukemia, or AML, and Intermediate-2 or High-Risk myelodysplastic syndromes, or higher risk MDS. Additionally, the COVID-19 pandemic may delay and disrupt regulatory activities and our manufacturing and supply chain and have other adverse effects on our business and operations.
- If we are unable to obtain and maintain sufficient intellectual property protection for imetelstat for an adequate amount of time, or if the scope of the intellectual property protection is not sufficiently broad, our competitors could develop and commercialize products similar or identical to imetelstat, and our ability to successfully commercialize imetelstat may be adversely affected.
- If competitors develop products, product candidates or technologies that are superior to or more cost-effective than imetelstat, this would significantly impact the development and commercial viability of imetelstat; severely and adversely affect our financial results, business and business prospects and the future of imetelstat; and might cause us to cease operations.
- In the absence of potential proceeds from exercises of currently outstanding warrants and potential drawdowns under our term loan facility, or Loan Agreement, with Hercules Capital Inc., or Hercules, and Silicon Valley Bank, or SVB, we will require substantial additional funding to further advance the imetelstat program, including through the completion of IMpactMF, IMproveMF and the investigator-led trial IMpress, as well as conducting the clinical, regulatory and potential commercialization activities necessary to potentially bring imetelstat to market in relapsed/refractory MF and any other future indications, and our need for additional funds may arise sooner than planned. We cannot predict with any certainty whether and to what extent the outstanding warrants will be exercised for cash, or the timing or availability of additional funds under the Loan Agreement, if at all, particularly given the recent closure of SVB by banking regulators. The global economic slowdown, inflation, rising interest rates and the prospects for recession, as well as recent and potential future disruptions in access to bank deposits or lending commitments due to bank failure, could materially and adversely affect our ability to raise additional capital, which could negatively affect our liquidity, our business and business prospects and the future of imetelstat. If we are unable to raise this capital when needed, we would be forced to delay, reduce or eliminate our research and development activities and other operations or

commercialization efforts which would have a material adverse effect on our business that might cause us to cease operations. Raising additional capital may subject us to unfavorable terms, cause dilution to our existing stockholders, restrict our operations, or require us to relinquish certain rights to imetelstat.

- We have incurred significant losses and negative cash flows from operations since our inception and anticipate that we will continue to incur significant expenses and losses for the foreseeable future.
- Our level of indebtedness and debt service obligations could adversely affect our financial condition, and may make it more difficult for us to fund our operations.
- We and certain of our officers have been named as defendants in pending securities class action lawsuits and shareholder derivative lawsuits. These lawsuits, and potential similar or related lawsuits, could result in substantial damages, divert management's time and attention from our business, and have a material adverse effect on our results of operations. These lawsuits, and any other lawsuits to which we are subject, will be costly to defend or pursue and are uncertain in their outcome.
- We are subject to legal and contractual obligations related to privacy and information security. Our actual or perceived failure, or that of third parties upon which we rely, to comply with such obligations could harm our business.
- Additionally, if our information technology systems or data, or those of third parties upon which we rely, are or were compromised, we could experience adverse consequences.
- Changes in and failures to comply with privacy and data protection obligations may adversely affect our business, operations and financial performance.

Calculation of Aggregate Market Value of Non-Affiliate Shares

For purposes of calculating the aggregate market value of shares of our common stock held by non-affiliates as set forth on the cover page of this annual report on Form 10-K, we have assumed that all outstanding shares are held by non-affiliates, except for shares held by each of our executive officers, directors and certain 5% or greater stockholders. In the case of 5% or greater stockholders, we have not deemed such stockholders to be affiliates unless there are facts and circumstances which would indicate that such stockholders exercise any control over Geron. These assumptions should not be deemed to constitute an admission that all executive officers, directors and certain 5% or greater stockholders are, in fact, affiliates of Geron, or that there are no other persons who may be deemed to be affiliates of Geron. Further information concerning shareholdings of our executive officers, directors and principal stockholders is incorporated by reference in Part III, Item 12 of this annual report on Form 10-K.

PART I

ITEM 1. BUSINESS

Company Overview

Summary

We are a late-stage biopharmaceutical company pursuing therapies with the potential to extend and enrich the lives of patients living with hematologic malignancies. Our investigational first-in-class telomerase inhibitor, imetelstat, harnesses Nobel Prize winning science in a treatment that may alter the underlying course of these diseases.

Our lead indication for imetelstat is in Low or Intermediate-1 risk myelodysplastic syndromes, or lower risk MDS. In January 2023, we reported positive top-line results from our IMerge Phase 3 clinical trial. The trial met its primary endpoint of 8-week transfusion independence rate and a key secondary endpoint of 24-week transfusion independence rate, demonstrating highly statistically significant (i.e., $P<0.001$ for both) and clinically meaningful benefits in imetelstat versus placebo. Furthermore, statistically significant and clinically meaningful efficacy results were observed in the trial across key subtypes, including patients who were ringed sideroblast positive, or RS positive, and ringed sideroblast negative, or RS negative; patients with high and very high baseline transfusion burden; and patients classified as Low or Intermediate-1 risk according to the International Prognostic Scoring System, or IPSS.

Based on the positive top-line data from IMerge Phase 3 and the prior IMerge Phase 2, we plan to submit a New Drug Application, or NDA, to the FDA in the U.S. in mid-2023 and a marketing authorization application, or MAA, in Europe in the second half of 2023 for the use of imetelstat in adult patients with lower risk MDS. If the NDA is accepted for filing and imetelstat is approved for commercialization by the FDA within the timelines we expect, we anticipate commercial launch of imetelstat in lower risk MDS in the U.S. could occur in the first half of 2024. In Europe, we anticipate review of the planned MAA, if validated by the European Medicines Agency, or EMA, could take approximately 14 months and, if approved, we anticipate that the commercial launch of imetelstat in lower risk MDS in Europe could occur by the end of 2024.

We believe that the positive top-line data from IMerge Phase 3 and IMerge Phase 2, as well as our prior Phase 2 clinical trial of imetelstat in patients with Intermediate-2 or High-Risk myelofibrosis who have relapsed after or are refractory to treatment with a janus associate kinase inhibitor, or JAK inhibitor, or relapsed/refractory MF, provide strong evidence that imetelstat targets telomerase to inhibit the uncontrolled proliferation of malignant stem and progenitor cells enabling recovery of bone marrow and normal blood cell production, which suggest potential disease-modifying activity. We believe this potential for disease modification could differentiate imetelstat from currently approved treatments in myeloid hematologic malignancies. Accordingly, in addition to lower risk MDS, we are developing imetelstat for the treatment of several myeloid hematologic malignancies with the following ongoing clinical trials:

- IMpactMF, a Phase 3 clinical trial in relapsed/refractory MF with overall survival, or OS, as the primary endpoint, that currently is enrolling patients. Based on our planning assumptions for enrollment and event (death) rates in the trial, we expect the interim analysis for OS in IMpactMF may occur in 2024, and the final analysis may occur in 2025. Because these analyses are event-driven and it is uncertain whether actual rates for enrollment and events will reflect current planning assumptions, the results may be available at different times than currently expected;
- IMproveMF, a Phase 1 combination clinical trial in first-line Intermediate-1, Intermediate-2 or High-Risk myelofibrosis, or frontline MF, that currently is enrolling patients and the first patient was dosed in April 2021; and
- IMpress, an investigator-led Phase 2 clinical trial in Intermediate-2 or High-Risk myelodysplastic syndromes, or higher risk MDS, and acute myeloid leukemia, or AML, with the initial clinical site planned to open in 2023.

Imetelstat Regulatory Designations

Imetelstat has been granted Fast Track designations by the FDA for development in two indications: (1) for the treatment of adult patients with transfusion-dependent anemia due to lower risk MDS, who do not have a deletion 5q chromosomal abnormality, also known as non-del(5q), and who are refractory or resistant to treatment with an erythropoiesis stimulating agent, or ESA (i.e., the treatment population in IMerge Phase 3); and (2) for the treatment of adult patients with Intermediate-2 or High-Risk MF whose disease has relapsed after or is refractory to

JAK inhibitor treatment (i.e., the treatment population in IMpactMF). The FDA granted orphan drug designation to imetelstat in June 2015 for the treatment of MF and for the treatment of MDS in December 2015, and the EMA granted orphan drug designation in December 2015 to imetelstat for the treatment of MF and in July 2020 for the treatment of MDS. In October 2021, we gained access to the Innovative Licensing and Access Pathway, or ILAP, in the United Kingdom, or U.K., through the receipt of an Innovation Passport for imetelstat to treat lower risk MDS.

Stage-Gated Milestone-Driven Global Commercial Plans for Imetelstat

If imetelstat is approved in lower risk MDS for marketing by regulatory authorities, we plan to commercialize imetelstat ourselves in the U.S. and may seek commercialization partners for territories outside of the U.S. We have therefore developed a commercial pre-launch and potential launch plan that is driven by the achievement of certain regulatory milestones, such as FDA acceptance for filing of our planned NDA, as well as EMA validation of our planned EU MAA submission. We are conducting pre-commercial preparations for the U.S., such as: enhancing and/or establishing company processes and systems to support a potential commercial launch, refining our market research in lower risk MDS, engaging in marketing and commercial access/reimbursement preparatory efforts, as well as executing on long-lead time activities, such as selecting a third-party logistics provider, completing state licensing requirements and hiring personnel to support potential sales, marketing and commercial operations. In light of the positive top-line IMerge Phase 3 results, we continue to evaluate our strategy for the potential launch and commercialization of imetelstat in Europe. Based on our internal estimates of pricing and addressable patient populations in 2030 and if regulatory authorities approve imetelstat for marketing in lower risk MDS and relapsed/refractory MF, we believe the combined potential peak market opportunity in the U.S. and key European markets for imetelstat is approximately $3.0 billion, of which lower risk MDS represents approximately $1.2 billion and relapsed/refractory MF represents approximately $1.8 billion.

Financial Resources

As of December 31, 2022, we had approximately $173.1 million in cash, cash equivalents, restricted cash and current and noncurrent marketable securities. On January 10, 2023, we completed an underwritten public offering of 68,007,741 shares of our common stock and a pre-funded warrant to purchase 25,000,000 shares of our common stock, or the 2023 pre-funded warrant. The net cash proceeds from this offering are approximately $213.3 million, after deducting the underwriting discount and other offering expenses paid by us, and excludes any future proceeds from the exercise of the 2023 pre-funded warrant. In addition, from January 1, 2023 through March 9, 2023, we have received $59.8 million in cash proceeds from the exercise of outstanding warrants.

Based on our current operating plan and our expectations regarding the timing of the submission and potential acceptance and approval of our planned NDA by the FDA for imetelstat in lower risk MDS and the potential commercialization in the U.S. for the use of imetelstat in adult patients with lower risk MDS, we believe that our existing cash, cash equivalents, restricted cash and current and noncurrent marketable securities, including the net cash proceeds from our recently closed underwritten public offering in January 2023 and the proceeds from the exercise of warrants that we received in the January and February 2023, will be sufficient to fund our projected operating requirements through the end of the third quarter of 2025, which includes potential U.S. commercial launch of imetelstat in lower risk MDS in the first half of 2024. In the absence of potential proceeds from exercises of currently outstanding warrants and potential drawdowns under the Loan Agreement, we will require substantial additional funding to further advance the imetelstat program, including through the completion of IMpactMF, IMproveMF and the investigator-led trial IMpress, as well as conducting the clinical, regulatory and potential commercialization activities necessary to potentially bring imetelstat to market in relapsed/refractory MF and any other future indications, and our need for additional funds may arise sooner than planned. We cannot predict with any certainty whether and to what extent the outstanding warrants will be exercised for cash, or the timing or availability of additional funds under the Loan Agreement, if at all, particularly given the recent closure of SVB by banking regulators.

Orphan Drug Designations and Market Exclusivity

Imetelstat has been granted orphan drug designations for both the treatment of myelodysplastic syndromes, or MDS, and MF in the U.S. and in Europe. In the U.S., under the Orphan Drug Act of 1983, orphan drug designation would convey market exclusivity in the designated indication for seven years after drug product approval. Thus, if we were to receive drug product approval in the U.S. for imetelstat in lower risk MDS in the first half of 2024, we anticipate that imetelstat will have orphan drug market exclusivity in the U.S. for such indication until the first half of 2031.

In Europe, under the European Union Orphan drug regulation (EC) No. 141/2000, orphan drug designation would convey 12 years of market exclusivity, assuming we maintain orphan drug designation and fulfill the agreed upon pediatric investigation plan under the European Union Orphan drug regulation (EC) No. 141/2000. Thus, if we were to receive drug product approval in Europe for imetelstat in lower risk MDS in the second half of 2024, we anticipate that imetelstat will have orphan drug market exclusivity in Europe for such indication until the second half of 2036.

Patents and Patent Term Extensions

We have issued U.S. and European patents that provide patent coverage into 2033 pertaining to the treatment of MF and MDS with imetelstat. We also hold issued patents covering imetelstat composition of matter.

In the U.S., our composition of matter patent coverage extends until December 2025, and our method of treatment patent rights for MDS and MF expire in March 2033. Under the provisions of the Drug Price Competition and Patent Term Restoration Act of 1984 (as amended), or the Hatch-Waxman Act, upon receipt of drug product approval, potential patent term extensions, if any, may be available to extend the patent term of either our composition of matter patent, or our method of treatment patent for MDS, in the U.S.

In Europe, our composition of matter patent coverage expires in September 2024, and our method of treatment patent rights for MDS and MF expire in November 2033 in member countries of the European Patent Convention. One of our patents in each member country of the European Patent Convention may be eligible for patent term extension under a Supplementary Protection Certificate, or SPC, permitted under European Council (EC) Regulation No. 469/2009, or the European SPC Regulation, upon receipt of drug product approval, such as, for example, our method of treatment patent for MDS.

The information provided in this section should be reviewed in the context of the section entitled “Risks Related to Protecting Our Intellectual Property” described in “Risk Factors” in Part I, Item 1A of this annual report on Form 10-K.

Telomerase: Scientific Rationale

Telomeres and Telomerase in Normal Development

In the human body, normal growth and maintenance of tissues occurs by cell division. However, most cells are only able to divide a limited number of times, and this number of divisions is regulated by telomere length. Telomeres are repetitions of a deoxyribonucleic acid, or DNA, sequence located at the ends of chromosomes. They act as protective caps to maintain stability and integrity of the chromosomes, which contain the cell’s genetic material. Normally, every time a cell divides, the telomeres shorten. Eventually, they shrink to a critically short length, and as a result, the cell either dies by apoptosis or stops dividing and senesces.

Telomerase is a naturally occurring enzyme that maintains telomeres and prevents them from shortening during cell division, such as stem cells that must remain immortalized to support normal health. Telomerase consists of at least two essential components: a ribonucleic acid, or RNA, template, which binds to the telomere, and a catalytic subunit with reverse transcriptase activity, which adds a specific DNA sequence to the chromosome ends. The 2009 Nobel Prize for Physiology or Medicine was awarded to Drs. Elizabeth H. Blackburn, Carol W. Greider and Jack Szostak, former Geron collaborators, for the discovery of how chromosomes are protected by both telomeres and telomerase.

Telomerase is active during embryonic development, enabling the rapid cell division that supports normal growth. During the latter stages of human fetal development and in adulthood, telomerase is repressed in most cells, and telomere length gradually decreases during a lifetime. In tissues that have a high turnover throughout life, such as blood and gut, telomerase can be transiently upregulated in progenitor cells to enable controlled, self-limited proliferation to replace cells lost through natural cell aging processes. As the progeny of progenitor cells mature, telomerase is downregulated and telomeres shorten with cell division, preventing uncontrolled proliferation.

Telomeres and Telomerase in Cancer

Telomerase is upregulated in many tumor progenitor cells, enabling the continued and uncontrolled proliferation of the malignant cells that drive tumor growth and progression. Telomerase expression has been found to be present in approximately 90% of biopsies taken from a broad range of human cancers. Our non-clinical studies, in which the telomerase gene was artificially introduced and expressed in normal cells grown in culture, have suggested that telomerase does not itself cause a normal cell to become malignant. Instead, the sustained

upregulation of telomerase enables tumor cells to maintain telomere length, providing them with the capacity for limitless proliferation. We believe that the sustained upregulation of telomerase is critical for tumor progression as it enables malignant progenitor cells to acquire cellular immortality and avoid apoptosis, or cell death.

Telomerase Inhibition and Hematologic Malignancies: Inducing Cancer Cell Death

We believe that inhibiting telomerase may be an attractive approach to treating cancer because it may limit the proliferative capacity of malignant stem and progenitor cells, which are believed to be important drivers of tumor growth and progression. We and others have observed in various in vitro and rodent tumor models that inhibiting telomerase: (a) results in telomere shortening and (b) arrests uncontrolled malignant cell proliferation and tumor growth.

Hematologic malignancies, or blood cancers, are classified according to the precursor cell type. A myeloid hematologic malignancy is a cancer that occurs in the myeloid hematopoietic progenitor cells, such as the precursor cells of red blood cells, platelets and certain myeloid white blood cells, such as granulocytes. Myeloid neoplasms include myeloproliferative neoplasms, MDS and AML. Examples of myeloproliferative neoplasms include chronic myeloid leukemia, essential thrombocythemia, or ET, polycythemia vera and MF. These myeloid neoplasms are different from lymphocytic malignancies which typically occur in the lymphoid cell progenitor lineage, such as precursor cells of T lymphocytes and B lymphocytes. Examples of lymphoid malignancies include acute lymphoblastic leukemia, chronic lymphocytic leukemia, lymphomas and multiple myeloma.

Many myeloid hematologic malignancies, such as ET, MF and MDS, have been shown to arise from malignant stem and progenitor cells that express higher telomerase activity and have shorter telomeres when compared to normal healthy cells. In vitro studies have suggested that tumor cells with short telomeres may be especially sensitive to the anti-proliferative effects of inhibiting telomerase.

Imetelstat: The First Telomerase Inhibitor to Advance to Clinical Development

Imetelstat, our proprietary telomerase inhibitor which was discovered and developed at Geron, was designed to inhibit telomerase in malignant cells with continuously upregulated telomerase.

Imetelstat is a lipid conjugated 13-mer oligonucleotide that we designed to be complementary to and bind with high affinity to the RNA template of telomerase, thereby directly inhibiting telomerase activity. Imetelstat does not act as an antisense inhibitor of protein translation. The compound has a proprietary thio-phosphoramidate backbone, which is designed to provide resistance to the effect of cellular nucleases, thus conferring improved stability in plasma and tissues, as well as improved binding affinity to its target. To improve the ability of imetelstat to penetrate cellular membranes, we conjugated the oligonucleotide to a lipid group. Imetelstat's IC50, or half maximal inhibitory concentration, is 3 – 9 nM in cell free assays. Single-dose kinetics in patients has shown dose-dependent increases in exposure to imetelstat, with a plasma half-life, which is the time it takes for the concentration or amount of imetelstat to be reduced by half, ranging from 4 – 5 hours. Data from animal studies and clinical trials have suggested that the residence time of imetelstat in bone marrow is long, with 0.19 – 0.51 μM observed at 41 – 45 hours after a 7.5 mg/kg dose in patients. Imetelstat also has been shown in non-clinical studies to exhibit relatively preferential inhibition of the clonal proliferation of malignant progenitor cells compared to normal progenitor cells. For these reasons, imetelstat has been studied as a potential treatment for malignant diseases.

We believe imetelstat is the first telomerase inhibitor to advance to clinical development. The Phase 1 trials that we completed evaluated the safety, tolerability, pharmacokinetics and pharmacodynamic effects of imetelstat. We established doses and dosing schedules that were tolerable and achieved target exposures in patients that were consistent with those required for efficacy in animal models. Following intravenous administration of imetelstat using tolerable dosing regimens, clinically relevant and significant inhibition of telomerase activity was observed in various types of tissue in which telomerase activity is measurable, including normal bone marrow hematopoietic cells, malignant plasma cells, hair follicle cells and peripheral blood mononuclear cells. Dose-limiting toxicities included thrombocytopenia, or reduced platelet count, and neutropenia, or reduced neutrophil count.

Proof-of-Concept of Imetelstat's Disease-Modifying Potential

We believe that imetelstat may have the potential to suppress the proliferation of malignant stem and progenitor cells while transiently affecting normal cells. Early clinical data from a Phase 2 trial of imetelstat in patients with ET, or the ET Trial, and a pilot study of imetelstat in patients with MF conducted at Mayo Clinic, or the Pilot Study, suggest imetelstat inhibits the progenitor cells of the malignant clones believed to be responsible for the underlying diseases in a relatively select manner, indicating potential disease-modifying activity. These data were published in two separate articles in a September 2015 issue of *The New England Journal of Medicine*.

Reported adverse events, or AEs, and laboratory investigations associated with imetelstat in the ET Trial and the Pilot Study included cytopenias, gastrointestinal symptoms, constitutional symptoms, and hepatic biochemistry abnormalities. Dose-limiting toxicities, such as profound and prolonged thrombocytopenia and neutropenia, and other safety issues, including death, were observed in the ET Trial and the Pilot Study. In those trials, such myelosuppression was managed by dose holds and modification rules.

Lead Indication in Phase 3 Clinical Development: Lower Risk Myelodysplastic Syndromes (MDS)

Unmet Medical Need in Lower Risk MDS for Broad and Durable Transfusion Independence

MDS is a group of blood disorders in which the proliferation of malignant progenitor cells produces multiple malignant cell clones in the bone marrow resulting in disordered and ineffective production of the myeloid lineage, which includes red blood cells, white blood cells and platelets. In MDS, bone marrow and peripheral blood cells may have abnormal, or dysplastic, cell morphology. MDS is frequently characterized clinically by severe anemia, or low red blood cell counts, and low hemoglobin. In addition, other peripheral cytopenias, or low numbers of white blood cells and platelets, may cause life-threatening infections and bleeding. Transformation to AML occurs in up to 30% of MDS cases and results in poorer overall survival.

MDS is the most common of the myeloid malignancies. There are approximately 60,000 people in the U.S. living with the disease and approximately 16,000 reported new cases of MDS in the U.S. every year. MDS is primarily a disease of the elderly, with median age at diagnosis around 70 years. The majority of patients, approximately 70%, fall into what are considered to be the lower risk groups at diagnosis, according to the International Prognostic Scoring System that assigns relative risk of progression to AML and overall survival by taking into account the presence of a number of disease factors, such as cytopenias and cytogenetics.

Chronic anemia is the predominant clinical problem in patients who have lower risk MDS. Typically, these patients are treated with ESAs, such as erythropoietin, or EPO. Although ESAs provide an improvement in anemia in approximately 50% of patients, the effect is transient with a median duration of response of approximately two years. Once ESAs fail for patients, HMAs and lenalidomide have been used to improve anemia, but with limited success, such as reported 8-week red blood cell transfusion independence, or RBC-TI, rates of 17% for azacitidine, an HMA, and 27% for lenalidomide. In April 2020, a new drug, Reblozyl (luspatercept) was approved for use in a subgroup of lower risk MDS patients – those with ringed sideroblasts. Such patients comprise approximately 15% to 30% of all lower risk MDS patients. The majority of patients who do not have ringed sideroblasts or who no longer respond to ESAs or other available drug therapies become dependent on red blood cell transfusions due to low hemoglobin. Serial red blood cell transfusions can lead to elevated levels of iron in the blood and other tissues, which the body has no normal way to eliminate. Iron overload is a potentially dangerous condition. Published studies in patients with MDS have shown that iron overload resulting from regular red blood cell transfusions is associated with a poorer overall survival and a higher risk of developing AML. We believe that, to date, no drug therapy has been shown prospectively to alter or delay the course of the disease in any human clinical trial.

IMerge: Ongoing Phase 2/3 Clinical Trial in Lower Risk MDS

Trial Design

IMerge is a two-part Phase 2/3 clinical trial evaluating imetelstat (7.5 mg/kg dose administered as a two-hour intravenous infusion every four weeks) in transfusion dependent lower risk MDS patients who are relapsed after, refractory to, or ineligible for prior treatment with an ESA. To be eligible for IMerge, patients were required to be transfusion dependent, defined as requiring at least four units of packed red blood cells, or RBCs, over an eight-week period during the 16 weeks prior to entry into the trial.

IMerge Phase 3 is a double-blind, 2:1 randomized, placebo-controlled clinical trial that, based on discussions with U.S. and European regulatory authorities, was designed to support, if successful, the registration of imetelstat in lower risk MDS. The trial enrolled patients with lower risk transfusion dependent MDS who were relapsed, or refractory to, or ineligible for ESA, had not received prior treatment with either a hypomethylating agent, or HMA, or lenalidomide and were non-del(5q). IMerge Phase 3 is being conducted at 118 medical centers globally in 17 countries in North America, Europe, Middle East and Asia.

The primary efficacy endpoint of IMerge Phase 3 is the rate of red blood cell transfusion independence, or RBC-TI, lasting at least eight weeks, defined as the proportion of patients without any RBC transfusions during any consecutive eight weeks since entry to the trial, or 8-week TI. Key secondary endpoints for IMerge Phase 3 include the rate of RBC-TI lasting at least 24 weeks, or 24-week TI, and the rate of hematologic improvement erythroid, or

HI-E, which is a rise in hemoglobin of at least 1.5 g/dL above the pretreatment level for at least eight weeks or a reduction of at least four units of RBC transfusions over eight weeks compared with the prior RBC transfusion burden. Other secondary endpoints include the time to and duration of RBC-TI; the proportion of patients achieving Complete Response, or CR, or Partial Response, or PR, according to the 2006 International Working Group, or IWG, criteria for MDS; the proportion of patients requiring RBC transfusions and the transfusion burden; the proportion of patients requiring the use of myeloid growth factors and the dose; assessments of the change in the patients' quality of life using several validated instruments; as well as an assessment of OS, and time to progression to AML.

Positive Top-Line Results from IMerge Phase 3

In January 2023, we reported positive top-line results from IMerge Phase 3. A total of 178 patients were enrolled in IMerge Phase 3, with patients randomized on a 2:1 basis to imetelstat (n=118) or placebo (n=60), and represents the intent-to-treat population in the trial. The population for the analysis of safety data is based on 177 patients (imetelstat, n=118, placebo, n=59) because one patient in the placebo arm was enrolled, but did not receive any treatment. The trial met its primary endpoint of 8-week TI rate and key secondary endpoint of 24-week TI rate, among others, demonstrating statistically significant and clinically meaningful results with imetelstat versus placebo with no new safety signals and safety results consistent with prior imetelstat clinical trials. Key patient participation information is as follows:

	Imetelstat (n=118)	**Placebo (n=60)**
Median time on study, months (range)	19.5 (1.4-36.2)	17.5 (0.7-34.3)
Median time on treatment, months (range)	7.8 (0.03-32.5)	6.5 (0.03-26.7)
Median time on treatment for 8-week TI responders, months (range)	17.2 (1.8-32.5)	15.0 (4.1-25.8)
Median treatment, cycles (range)	8 (1-34)	8 (1-30)
Median treatment cycles for 8-week TI responders, months (range)	18 (3-34)	17 (3-29)

Key baseline demographics and disease characteristics of patients in IMerge Phase 3, summarized below, demonstrate the broad range of lower risk MDS subtypes, and patients with high disease burden, enrolled in the trial:

	Imetelstat (n=118)	**Placebo (n=60)**
Age, years, median (range)	71.5 (44-87)	73.0 (39-85)
WHO 2001 category, n (%)		
RS+	73 (61.9)	37 (61.7)
RS-	44 (37.3)	23 (38.3)
RBC transfusion burden, units/8 weeks, median (range)	6 (4-33)	6 (4-13)
4 - 6 units / 8 weeks, n (%)	62 (52.5)	33 (55.0)
>6 units / 8 weeks, n (%)	56 (47.5)	27 (45.0)
IPSS risk category, n (%)		
Low	80 (67.8)	39 (65.0)
Intermediate-1	38 (32.2)	21 (35.0)
Prior luspatercept use, n (%)*	7 (5.9)	4 (6.7)
Pre-treatment hemoglobin, median (range), g/dL**	7.9 (5.3-10.1)	7.8 (6.1-9.2)

* There were an insufficient number of patients (imetelstat: 7/118; placebo: 4/60) who were previously treated with luspatercept enrolled in IMerge Phase 3 to draw conclusions about the effect of imetelstat treatment in such patients. Of these patients, no imetelstat-treated patients and one placebo patient achieved 8-week TI.

** Pretreatment hemoglobin is defined as the average of all hemoglobin values in the eight weeks prior to the first dose date, excluding values that were within 14 days after transfusion (thus considered to be influenced by transfusion).

After a median follow-up time of 18 months for all patients in the trial, the following chart is the status of patients as of October 13, 2022, the clinical cut-off date for top-line results.

	Imetelstat (n=118)	**Placebo (n=59)**
Treatment ongoing, n (%)	27 (22.9)	14 (23.7)
Treatment discontinued, n (%)	91 (77.1)	45 (76.3)
Lack of efficacy	28 (23.7)	25 (42.4)
Adverse event	19 (16.1)	0
Cytopenias	11 (9.3)	0
Unrelated	8 (6.8)	0
Disease relapse after initial response on study	17 (14.4)	1 (1.7)
Patient decision	16 (13.6)	10 (16.9)
Progressive disease	7 (5.9)	5 (8.5)
AML progression	2 (1.7)	1 (1.7)
Investigator decision	2 (1.7)	2 (3.4)
Death*	1 (0.8)	2 (3.4)
Lost to follow up	1 (0.8)	0

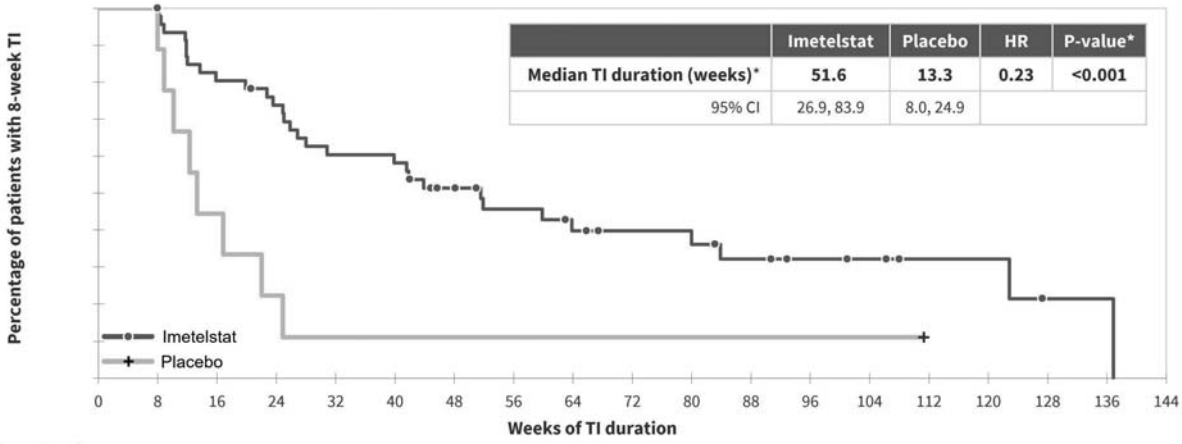
* On imetelstat treatment arm, patient death: neutropenic sepsis not related to drug after ~two-year treatment duration
On placebo treatment arm, patient deaths: (1) COVID-19 and (1) heart valve issue

Efficacy results for the primary 8-week TI endpoint and 24-week TI secondary endpoint summarized below illustrate the depth and durability of transfusion independence demonstrated with high statistical significance for imetelstat versus placebo in IMerge Phase 3.

	Imetelstat (n=118)	**Placebo (n=60)**	**P-value ***
Primary endpoint: 8-week TI, n (%)	47 (39.8)	9 (15.0)	<0.001
95% confidence interval	(30.9, 49.3)	(7.1, 26.6)	
Secondary endpoint: 24-week TI, n (%)	33 (28.0)	2 (3.3)	<0.001
95% confidence interval	(20.1, 37.0)	(0.4, 11.5)	

* Cochran Mantel Haenszel test stratified for prior RBC transfusion burden (≤6 units or >6 units of RBCs/8 weeks) and baseline IPSS risk score (Low or Intermediate-1)

Highly statistically significant (p<0.001; hazard ratio 0.23) durable transfusion independence was achieved with median TI duration approaching one year (95% CI (weeks): 26.9, 83.9) for imetelstat and approximately 13 weeks for placebo (95% CI (weeks): 8.0, 24.9), using Kaplan Meier estimates, as shown in the following graph. Approximately 83% of patients achieving 8-week TI had a single continuous TI period. For imetelstat patients achieving 24-week TI, the median TI duration was 80.0 weeks (95% CI (weeks): 51.6, not estimable (NE)). In addition, approximately 70% of imetelstat patients who achieved 8-week TI continued to achieve 24-week TI.



	Imetelstat	Placebo	HR	P-value*
Median TI duration (weeks)*	51.6	13.3	0.23	<0.001
95% CI	26.9, 83.9	8.0, 24.9		

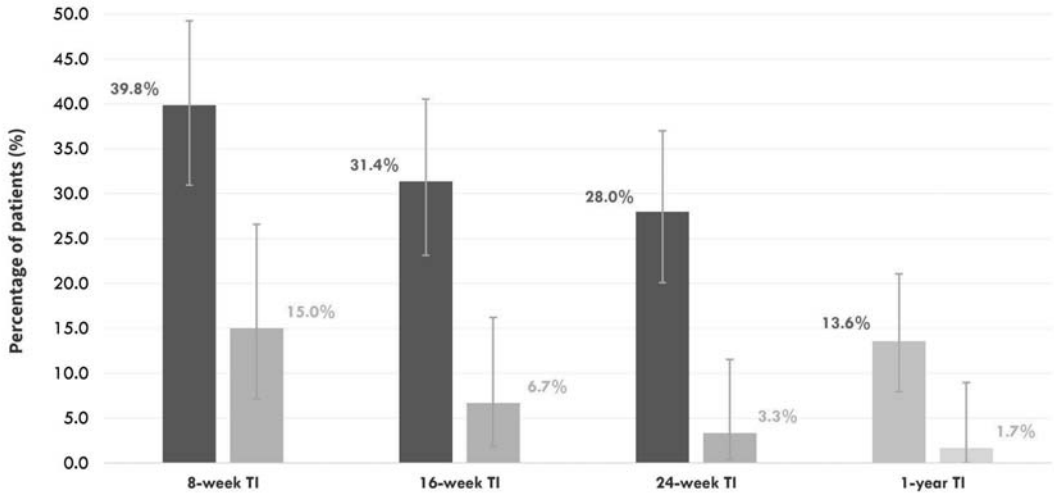
Number of patients

Imetelstat	47	47	37	33	27	26	20	16	13	11	11	8	6	5	3	3	1	1	0
Placebo	9	9	4	2	1	1	1	1	1	1	1	1	1	1	0				

* Kaplan-Meier estimates of duration of RBC TI; 8-week TI Responder Analysis Set; Hazard ratio is from the Cox proportional hazard model, stratified by prior RBC transfusion burden (<=6 vs. >6 units RBC) and IPSS risk group (Low vs. Intermediate-1), with treatment as the only covariate; P-value for superiority of imetelstat versus placebo in hazard ratio is based on stratified log-rank test.

CI = confidence interval; HR = hazard ratio; RBC = red blood cell; TI = transfusion independence

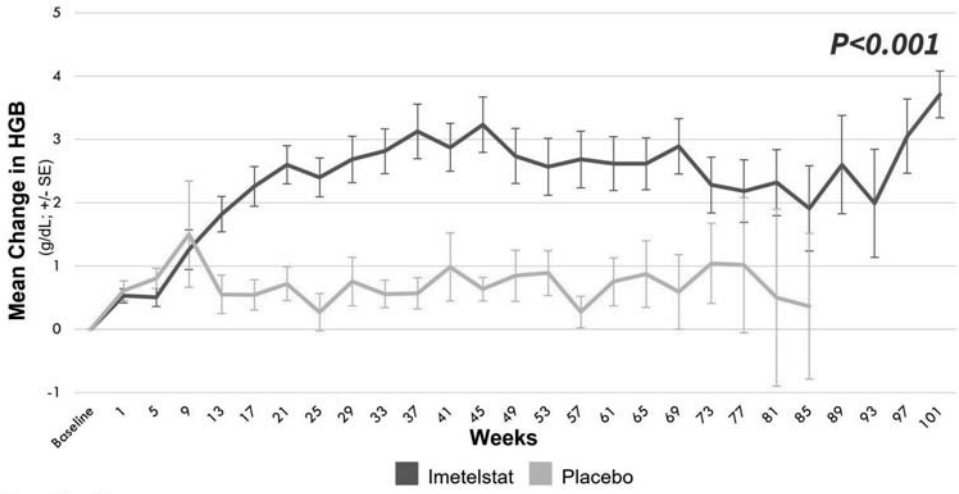
In addition, there was an increasing magnitude of benefit for imetelstat versus placebo with longer time intervals, as shown in the graph below.



P-value is based on Cochran Mantel Haenszel test stratified for prior RBC transfusion burden (≤6 units or >6 units of RBCs/8 weeks) and baseline IPSS risk score (Low or Intermediate-1)

16-week TI = proportion of patients without any RBC transfusion for at least 16 consecutive weeks since entry to the trial; 1-year TI = proportion of patients without any RBC transfusion for at least 52 consecutive weeks since entry to the trial

Highly statistically significant (p<0.001) increase in hemoglobin levels over time for imetelstat patients as shown in the graph below. For patients achieving 8-week TI, median increases in hemoglobin were 3.6 g/dL for imetelstat and 0.8 g/dL for placebo. The peak hemoglobin reached for these patients was 11.3 g/dL for imetelstat and 8.9 g/dL for placebo.



Number of patients

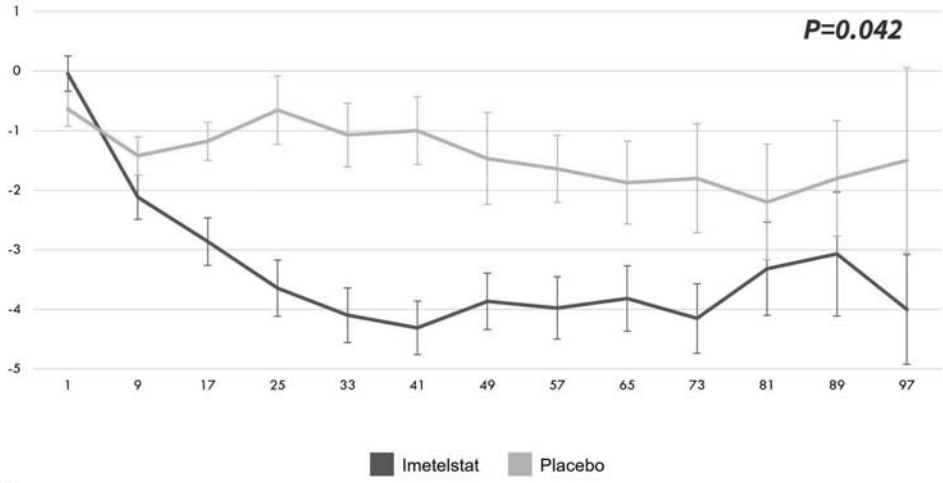
Imetelstat	118	59	53	54	47	42	48	48	43	43	31	37	31	35	32	25	26	24	23	21	19	18	11	11	9	9	5
Placebo	60	37	29	17	16	18	15	8	10	10	11	7	3	9	8	9	7	7	5	5	4	2	4				

The mean changes from the minimum Hgb of the values that were after 14 days of transfusions in the eight weeks prior to the first dose date are shown. Data points that have fewer than four patients are not shown.

P-value is based on a mixed model for repeated measures with Hgb change as the dependent variable, week, stratification factors, minimum Hgb in the eight weeks prior to the first dose date, and treatment arm as the independent variables with autoregressive moving average (ARMA(1,1)) covariance structure.

SE = standard error

Corresponding to the increases in hemoglobin, a statistically significant decrease in the number of RBC units transfused was achieved for imetelstat treated patients versus placebo, as shown in the graph below.



Number of patients

Imetelstat	115	104	95	76	60	55	45	43	33	26	22	14	10
Placebo	58	53	48	32	27	22	15	14	8	5	5	5	4

P-value is based on a mixed model for repeated measures with change in RBC transfusion as the dependent variable, week, stratification factors, prior transfusion burden, and treatment arm as the independent variables with autoregressive moving average (ARMA(1,1)) covariance structure.

Furthermore, as shown in the table below, statistically significant 8-week RBC-TI was observed with imetelstat versus placebo across lower risk MDS subtypes ($p<0.05$) and similar 8-week RBC-TI was observed for imetelstat within each subtype category in comparison to the overall population.

	Imetelstat, n (%)	**Placebo, n (%)**	**Difference (95% CI)**	**P-value***
Overall	47/118 (39.8)	9/60 (15.0)	24.8 (9.9, 36.9)	<0.001
WHO category				
RS+	33/73 (45.2)	7/37 (18.9)	26.3 (5.9, 42.2)	0.016
RS-	14/44 (31.8)	2/23 (8.7)	23.1 (-1.3, 40.6)	0.038
Transfusion burden				
4-6 units	28/62 (45.2)	7/33 (21.2)	23.9 (1.9, 41.4)	0.027
>6 units	19/56 (33.9)	2/27 (7.4)	26.5 (4.7, 41.8)	0.023
IPSS risk category				
Low	32/80 (40.0)	8/39 (20.5)	19.5 (-0.1, 35.2)	0.034
Intermediate-1	15/38 (39.5)	1/21 (4.8)	34.7 (8.8, 52.4)	0.004

* Cochran Mantel Haenszel test stratified for prior RBC transfusion burden (≤6 units or >6 units of RBCs/8 weeks) and baseline IPSS risk score (Low or Intermediate-1)

Specifically for the RS+ and RS- subtypes, statistically significant improvement in both 8-week and 24-week TI was achieved with imetelstat versus placebo, as shown in the table below.

	RS+			**RS-**		
	Imetelstat (n=73)	**Placebo (n=37)**	**P-value***	**Imetelstat (n=44)**	**Placebo (n=23)**	**P-value***
8-week TI responders, n (%)	33 (45.2)	7 (18.9)	0.016	14 (31.8)	2 (8.7)	0.038
Median duration of TI*, weeks (95% CI)	46.9 (25.9, 83.9)	16.9 (8.0, 24.9)	0.035	51.6 (11.9, NE)	11.2 (10.1, NE)	0.062
24-week TI responders, n (%)	24 (32.9)	2 (5.4)	0.003	9 (20.5)	0 (0.0)	0.019
Median duration of TI*, weeks (95% CI)	80.0 (41.6, NE)	NE (24.9, NE)	0.808	122.9 (25.0, NE)	NE (NE, NE)	NE

* Kaplan-Meier estimates of duration of RBC TI; 8-week/24-week TI Responder Analysis Set; P-value for TI rate is based on Cochran Mantel Haenszel test stratified for prior RBC transfusion burden (≤6 units or >6 units of RBCs/8 weeks) and baseline IPSS risk score (Low or Intermediate-1); P-value for duration of TI is based on stratified log-rank test.

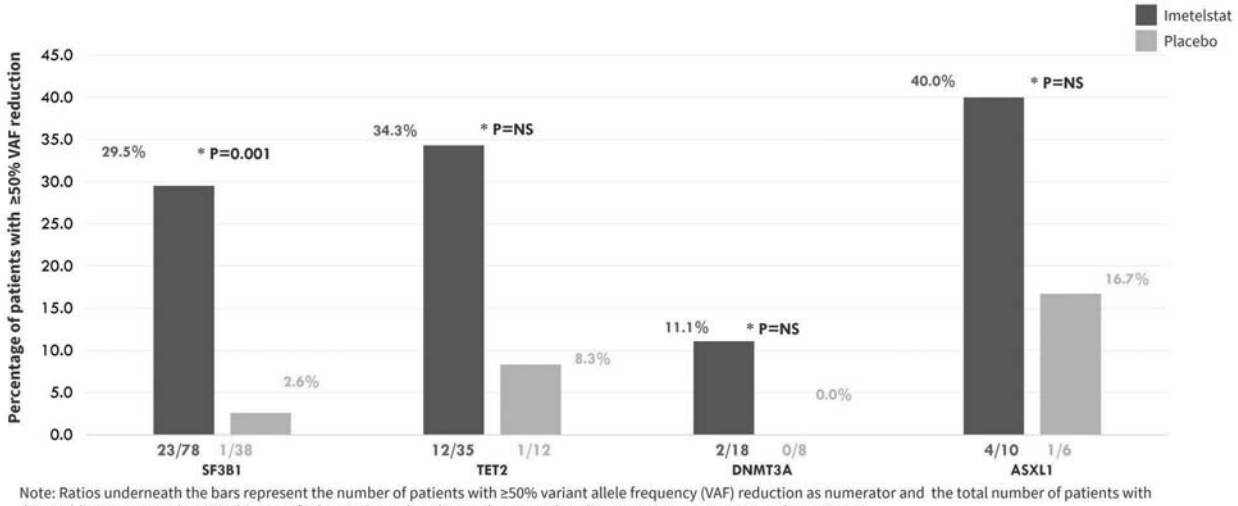
NE Not estimable

The IMerge Phase 3 protocol specified use of the International Working Group, or IWG, 2006 criteria to measure HI-E and was not statistically significant (p=0.112) for imetelstat versus placebo. The current IWG 2018 HI-E criteria places greater emphasis on durability by measuring response for ≥16 weeks, rather than ≥8 weeks. Under these new 2018 IWG criteria, a highly statistically significant (p<0.001) HI-E rate was achieved for imetelstat versus placebo. See the table below for HI-E response under both 2018 and 2006 IWG criteria.

	Imetelstat (n=118)	**Placebo (n=60)**	**P-value ***
HI-E per IWG 2018, n (%)	**50 (42.4)**	**8 (13.3)**	**<0.001**
95% CI, %	(33.3, 51.8)	(5.9, 24.6)	
16-week TI, n (%)	37 (31.4)	4 (6.7)	<0.001
95% CI, %	(23.1, 40.5)	(1.9, 16.2)	
Transfusion reduction by ≥50%/16 weeks	51 (43.2)	9 (15.0)	<0.001
95% CI, %	(34.1, 52.7)	(7.1, 26.6)	
HI-E per IWG 2006, n (%)	**75 (63.6)**	**31 (51.7)**	**0.112**
95% CI, %	(54.2, 72.2)	(38.4, 64.8)	
≥1.5 g/dL increase in Hgb ≥8 weeks, n (%)	40 (33.9)	6 (10.0)	<0.001
95% CI, %	(25.4, 43.2)	(3.8, 20.5)	
Transfusion reduction by ≥4U/8 weeks, n (%)	71 (60.2)	30 (50.0)	0.175
95% CI, %	(50.8, 69.1)	(36.8, 63.2)	

* Cochran Mantel Haenszel test stratified for prior RBC transfusion burden (≤6 units or >6 units of RBCs/8 weeks) and baseline IPSS risk score (Low or Intermediate-1)

Clinical and molecular evidence supporting the potential for disease modification with imetelstat includes a one-year median TI duration for imetelstat 8-week TI responders, a median rise of 3.6 g/dL in hemoglobin levels in those same patients and ≥50% variant allele frequency decreases in SF3B1, TET2, DNMT3A and ASXL1 mutations, as shown in the graph below.



Note: Ratios underneath the bars represent the number of patients with ≥50% variant allele frequency (VAF) reduction as numerator and the total number of patients with detectable assessment (≥5% VAF) in specified mutation at baseline and any post baseline mutation assessment as denominator.

* P-value is based on Cochran Mantel Haenszel test stratified for prior RBC transfusion burden (≤6 units or >6 units of RBCs/8 weeks) and baseline IPSS risk score (Low or Intermediate-1)

VAF = variant allele frequency; NS = not significant

The safety results in IMerge Phase 3 were consistent with prior clinical trials of imetelstat in hematologic malignancies, and no new safety signals were identified. The most frequent non-hematologic toxicities occurring in ≥10% of patients on either imetelstat or placebo arms are listed in the table below. Grade 3 elevations in liver function tests, or LFTs, on imetelstat were short in duration (median < 2 weeks) and more than 80% resolved to Grade 2 or lower within 4 weeks, with no cases of liver test elevations consistent with Hy's Law or Drug Induced Liver Injury.

AE, n (%)	**Imetelstat (n=118)**		**Placebo (n=59)**	
	All Grades	**Grade 3/4**	**All Grades**	**Grade 3/4**
Asthenia	22 (18.6)	0	8 (13.6)	0
COVID-19*	21 (17.8)	2 (1.7)	9 (15.2)	3 (5.1)
Peripheral edema	13 (11.0)	0	8 (13.6)	0
Headache	15 (12.7)	1 (0.8)	3 (5.1)	0
Diarrhea	14 (11.9)	1 (0.8)	7 (11.9)	1 (1.7)
Alanine aminotransferase increased	14 (11.9)	3 (2.5)	4 (6.8)	2 (3.4)
Hyperbilirubinemia	11 (9.3)	1 (0.8)	6 (10.2)	1 (1.7)
Constipation	9 (7.6)	0	7 (11.9)	0
Pyrexia	9 (7.6)	2 (1.7)	7 (11.9)	0

* Includes COVID-19, asymptomatic COVID-19, COVID-19 pneumonia

LFT Lab Abnormality, n (%)	**Imetelstat (n=118)**		**Placebo (n=59)**	
	All Grades	**Grade 3**	**All Grades**	**Grade 3**
Alanine Aminotransferase (ALT*)	46 (39.3)	4 (3.4)	22 (37.3)	3 (5.1)
Alkaline Phosphatase (ALP)	53 (44.9)	0	7 (11.9)	0
Aspartate Aminotransferase (AST)	57 (48.3)	1 (0.8)	13 (22.0)	1 (1.7)
Bilirubin	46 (39.0)	1 (0.8)	23 (39.0)	1 (1.7)

* n=117 for ALT imetelstat patients

The most frequent hematologic toxicities are listed in the table below.

AE, n (%)	**Imetelstat (n=118)**		**Placebo (n=59)**	
	All Grades	**Grade 3/4**	**All Grades**	**Grade 3/4**
Thrombocytopenia	89 (75.4)	73 (61.9)	6 (10.2)	5 (8.5)
Neutropenia	87 (73.7)	80 (67.8)	4 (6.8)	2 (3.4)
Anemia	24 (20.3)	23 (19.5)	6 (10.2)	4 (6.8)
Leukopenia	12 (10.2)	9 (7.6)	1 (1.7)	0

Clinical consequences from cytopenias were similar between imetelstat and placebo groups as shown in the table below.

Event, n (%)	Imetelstat (n=118)	Placebo (n=59)
Grade ≥3 bleeding events*	3 (2.5)	1 (1.7)
Grade ≥3 infections+	13 (11.0)	8 (13.6)
Grade febrile neutropenia**	1 (0.8)	0

* No ≥Grade 3 bleeding events in the setting of Grade 3/4 thrombocytopenia; on imetelstat: two patients with Grade 4 gastrointestinal bleeding, unrelated and resolved and one Grade 3 hematuria, unrelated and resolved

\+ On imetelstat: three patients with Grade 3/4 infections in setting of Grade 3/4 neutropenia; all three were sepsis and resolved with only one considered related

** Occurred at day 33, lasted 8 days; assessed by investigator as possibly related to imetelstat; patient subsequently achieved TI >40 weeks and remains on treatment at data cut-off

Furthermore, as shown in the table below, the median duration of cytopenias was shorter for imetelstat versus placebo and the resolution to Grade 2 or lower was higher for imetelstat versus placebo.

	Imetelstat+	Placebo
Thrombocytopenia events*		
Median duration, weeks, (range)	1.4 (0.1-12.6)	2.0 (0.3-11.6)
Resolved within <4 weeks, %	86.3	44.4
Neutropenia events*		
Median duration, weeks, (range)	1.9 (0-15.9)	2.2 (1.0-4.6)
Resolved within <4 weeks, %	81.0	50.0

\+ 18% of imetelstat treated patients received a median of 1 platelet transfusions; 35% of imetelstat treated patients received growth factor support

* Analysis performed for patients who experienced Grade 3/4 cytopenias. Resolution determined by return to Grade 2 or lower

Planned Next Steps to Advance Imetelstat in Lower Risk MDS Toward Potential Commercialization

We plan to present additional data from IMerge Phase 3 at medical meetings later this year, including data relating to potential correlation of decreases in mutation burden and abnormal cytogenetic clones with clinical responses, patient reported outcomes, human telomerase reverse transcriptase, or hTERT, and telomerase activity biomarker data and continued follow-up of durability of transfusion independence.

We believe the depth, breadth and durability of transfusion independence reported from IMerge Phase 3 to date, as well as from IMerge Phase 2, provide strong support for our planned regulatory submissions in the U.S. and in the EU for the use of imetelstat in patients with lower risk MDS. We therefore plan to submit an NDA in the U.S. in mid-2023 and an MAA in Europe in the second half of 2023 for the use of imetelstat in adult patients with lower risk MDS. With Fast Track designation for imetelstat from the FDA for the treatment of adult patients with transfusion-dependent anemia due to lower risk MDS, non-del(5q), and who are refractory or resistant to treatment with an ESA (i.e., the treatment population in IMerge Phase 3), the FDA granted our request for rolling submission of the NDA. If the NDA is accepted for filing and approved within the timelines we expect, we anticipate that the commercial launch of imetelstat in lower risk MDS could occur in the U.S. in the first half of 2024. In Europe, we anticipate review of the planned MAA, if validated by the EMA could take approximately 14 months and, if approved, we anticipate that the commercial launch of imetelstat in lower risk MDS in Europe could occur by the end of 2024.

Second Indication in Phase 3 Clinical Development: Myelofibrosis (MF)

Unmet Medical Need in Relapsed/Refractory MF for Improvement in Overall Survival

MF, a type of myeloproliferative neoplasm, is a chronic blood cancer in which abnormal or malignant precursor cells in the bone marrow proliferate rapidly, causing scar tissue, or fibrosis, to form. As a result, normal blood production in the bone marrow is impaired and may shift to other organs, such as the spleen and liver, which can cause them to enlarge substantially. People with MF may have abnormally low or high numbers of circulating RBCs, white blood cells or platelets, and abnormally high numbers of immature cells in the blood or bone marrow. MF patients can also suffer from debilitating constitutional symptoms, such as drenching night sweats, fatigue, severe itching, or pruritus, abdominal pain, fever and bone pain. There are approximately 13,000 patients living with MF in the U.S. and approximately 3,000 reported new cases each year. Up to 20% of patients with MF develop AML.

Approximately 70% of MF patients are classified as having Intermediate-2 or High-risk disease, as defined by the Dynamic International Prognostic Scoring System Plus described in a 2011 *Journal of Clinical Oncology* article. Drug therapies currently approved by the FDA and other regulatory authorities for treating these MF patients include JAK inhibitors, ruxolitinib and fedratinib, as well as pacritinib, a kinase inhibitor. Currently, no drug therapy is approved for those patients who fail or no longer respond to JAK inhibitor treatment, and median survival for MF patients after discontinuation from ruxolitinib is only approximately 14 – 16 months, representing a significant unmet medical need.

IMpactMF: Ongoing Phase 3 Clinical Trial in Relapsed/Refractory MF

Trial Design

IMpactMF, our Phase 3 clinical trial in relapsed/refractory MF, is an open label, 2:1 randomized, controlled clinical trial designed to evaluate imetelstat (9.4 mg/kg administered by intravenous infusion over two hours every three weeks) in approximately 320 patients. Patients relapsed after or refractory to a JAK inhibitor are defined as having an inadequate spleen response or symptom response after treatment with a JAK inhibitor for at least six months, including an optimal dose of a JAK inhibitor for at least two months. The best available therapy, or BAT, control arm of IMpactMF excludes the use of JAK inhibitors. With respect to the trial design for IMpactMF, the FDA urged us to consider adding a third dosing arm to assess a lower dose and/or a more frequent dosing schedule that might improve the planned trial's chance of success by identifying a less toxic regimen and/or more effective spleen response, one of the trial's secondary endpoints. Based on data from IMbark, we believe that testing a lower dose regimen would likely result in a lower median OS, which is the trial's primary endpoint, in the imetelstat treatment arm. We believe existing data also suggest that lowering the dose would not result in a clinically meaningful reduction in toxicity. For these reasons, we therefore determined not to add a third dosing arm to the trial design, and the FDA did not object to our proposed imetelstat dose and schedule of 9.4 mg/kg every three weeks.

The primary efficacy endpoint for IMpactMF is OS. Key secondary endpoints include symptom response; spleen response; progression free survival; complete remission, partial remission or clinical improvement, as defined by the International Working Group for Myeloproliferative Neoplasms Research and Treatment criteria; duration of response; safety; pharmacokinetics; and patient reported outcomes. Currently, we have selected 165 of the planned 180 sites to participate in IMpactMF across North America, South America, Europe, Australia and Asia.

IMpactMF is designed with >85% power to detect a 40% reduction in the risk of death (hazard ratio=0.60; one-sided alpha=0.025). The final analysis for OS is planned to be conducted after more than 50% of the patients planned to be enrolled in the trial have died (referred to as an event). An interim analysis of OS, in which the alpha spend is expected to be approximately 0.01, is planned to be conducted after approximately 70% of the total projected number of events (deaths) for the final analysis have occurred.

Current Status of IMpactMF

IMpactMF opened for patient screening and enrollment in December 2020. As of December 31, 2022, we had 140 of the 165 selected sites open for patient enrollment, and we are continuing to select additional sites. The first patient was dosed in April 2021. Given the uncertain and unpredictable impact of the COVID-19 pandemic on our clinical trial activities, including the constraints on clinical site personnel resources due to other competing trials in MF at the sites where IMpactMF is planned to be conducted, under current planning assumptions, we expect IMpactMF to be fully enrolled in 2024. Based on our planning assumptions for enrollment and event (death) rates in the trial, we expect the interim analysis for OS in IMpactMF may occur in 2024 and the final analysis may occur in 2025. Because these analyses are event-driven and it is uncertain whether actual rates for enrollment and events will

reflect current planning assumptions, the results may be available at different times than currently expected. At the interim analysis, if the pre-specified statistical OS criterion is met, then we expect such data may potentially support the registration of imetelstat in relapsed/refractory MF. Subject to protocol-specified stopping rules for futility, if the pre-specified OS criterion is not met at the interim analysis, the trial will continue to the final analysis, which is expected to occur approximately one year later.

The timing and achievement of either or both of the planned analyses depend on numerous factors, including delays or interruptions related to the effects of the COVID-19 pandemic or geopolitical events. In addition, our ability to enroll, conduct and complete IMpactMF depends on whether we can obtain and maintain the relevant clearances from regulatory authorities and other institutions to enroll, conduct and complete the trial, and our ability to raise additional capital if and when needed in order to complete the trial.

Improvement in Overall Survival and Potential Disease-Modifying Activity Observed in IMbark Phase 2

The IMbark Phase 2 clinical trial was designed to evaluate two dosing regimens of imetelstat (either 4.7 mg/kg or 9.4 mg/kg administered by intravenous infusion every three weeks) in patients with relapsed/refractory MF. The co-primary efficacy endpoints for IMbark were spleen response rate, defined as the proportion of patients who achieve a reduction of at least 35% in spleen volume as assessed by imaging, and symptom response rate, defined as the proportion of patients who achieve a reduction of at least 50% in Total Symptom Score, at 24 weeks. Key secondary endpoints were OS and safety.

We previously reported efficacy and safety results from the IMbark Phase 2 clinical trial, including median OS of 28.1 months for patients on the high dose arm of the study, which is almost twice the reported median OS of 14 – 16 months in medical literature. To evaluate this potential benefit, we conducted a post-hoc analysis of OS for patients treated with imetelstat 9.4 mg/kg in IMbark compared to OS calculated from real world data, or RWD, collected at the Moffitt Cancer Center for patients who had discontinued treatment with ruxolitinib, a JAK inhibitor, and who were subsequently treated with BAT. To make a comparison between the IMbark data and RWD, a cohort from the real-world dataset was identified that closely matched the IMbark patients, using guidelines for inclusion and exclusion criteria as defined in the IMbark clinical protocol, such as platelet count and spleen size. Calculations from two propensity score analysis approaches resulted in a median OS of 30.7 months for the imetelstat-treated patients from IMbark, which is more than double the median OS of 12.0 months using RWD for patients treated with BAT. These analyses also showed a 65% – 67% lower risk of death for the imetelstat-treated patients vs. BAT-treated patients. We believe these analyses suggest potentially longer OS for imetelstat-treated relapsed/refractory MF patients in IMbark, compared to BAT in closely-matched patients from RWD. However, comparative analyses between RWD and our clinical trial data have several limitations. For instance, the analyses create a balance between treatment groups with respect to commonly available covariates, but do not take into account the unmeasured and unknown covariates that may affect the outcomes of the analyses. Potential biases are introduced by factors which include, for example, the selection of the patients included in the analyses, misclassification in the matching process, the small sample size, and estimates that may not represent the outcomes for the true treated patient population. For these and other reasons, such comparative analyses and any conclusions from such analyses should be considered carefully and with caution, and should not be relied upon as demonstrative or otherwise predictive or indicative of any current or potential future clinical trial results of imetelstat in relapsed/refractory MF, including IMpactMF.

In IMbark, patients also experienced other positive clinical outcomes, including symptom improvement, spleen reduction and bone marrow fibrosis improvement. In June 2020, we reported correlation analyses from IMbark that showed a trend of longer OS in patients who achieved symptom response, spleen volume reductions and improved bone marrow fibrosis, in a dose-dependent manner. Furthermore, the reductions in the variant allele frequency of key driver mutations in MF and the improvement in bone marrow fibrosis observed in IMbark have also been correlated to the improvement in OS. We believe the improvement in bone marrow fibrosis, potential survival benefit, molecular data and correlations from IMbark provide strong evidence of the potential for disease modification with imetelstat, which we believe differentiates imetelstat from currently approved treatments for MF.

The safety results observed in IMbark were consistent with prior clinical trials of imetelstat in hematologic malignancies, and no new safety signals were identified. In the 9.4 mg/kg arm, reversible and manageable Grade 3/4 thrombocytopenia and neutropenia were reported in 24/59 patients (41%) and 19/59 patients (32%), respectively, without significant clinical consequences. 1/59 patients (2%) had Grade 3 febrile neutropenia. 3/59 patients (5%) had Grade 3/4 bleeding. 6/59 patients (10%) had Grade 3/4 infections. Furthermore, more than 70% of the observed Grade 3/4 cytopenias resolved to Grade 2 or lower by laboratory assessment within four weeks.

Exploratory Clinical Trials of Imetelstat in Additional Indications

IMproveMF: Phase 1 Combination Clinical Trial in Frontline Myelofibrosis (Frontline MF)

IMproveMF is a two-part Phase 1 clinical trial evaluating imetelstat in combination with ruxolitinib in patients with frontline MF. The trial is designed to use a Bayesian Optimal Interval design to test various doses of imetelstat in an escalating dose sequence with a defined number of patients per dosing arm. Escalation to the next higher dosing arm will only occur if the prior dose is tolerable to the patients. The primary objective of the first part of IMproveMF is to identify a recommended dosing regimen for further evaluation. Up to 20 patients are expected to be enrolled into the first part of IMproveMF, or IMproveMF Part 1. The first patient was dosed in IMproveMF in August 2022.

Upon identification of a tolerable dosing regimen for the combination treatment of imetelstat and ruxolitinib, the second part of IMproveMF, or IMproveMF Part 2, is planned to evaluate the efficacy and further evaluate the safety of that dosing regimen. Under IMproveMF Part 2, the primary endpoints are safety and symptom response rate, defined as the proportion of patients who achieve a ≥50% reduction in Total Symptom Score at 24 weeks. Secondary endpoints include change in fibrosis; spleen response rate, defined as the proportion of patients who achieve a ≥35% reduction in spleen volume from baseline as assessed by imaging; and the number of patients achieving complete remission, partial remission or clinical improvement, as defined by the International Working Group for Myeloproliferative Neoplasms Research and Treatment criteria. Up to 20 patients are expected to be enrolled into the IMproveMF Part 2.

As of December 31, 2022, two clinical sites in the U.S. were open for enrollment. We plan to open the remaining U.S. clinical site for enrollment in 2023.

IMpress: Investigator-Led Phase 2 Clinical Trial in Higher Risk Myelodysplastic Syndromes (Higher Risk MDS) and Acute Myeloid Leukemia (AML)

In collaboration with investigators in Germany, France and Australia, we are supporting IMpress, an investigator-led study of imetelstat in patients with higher risk MDS and relapsed/refractory AML, post-treatment with a hypomethylating agent, or HMA. The first site is planned to open in 2023.

IMpress is an open-label, single arm, Phase 2 clinical trial being conducted at three clinical sites. The primary endpoint is overall response rate per criteria from the 2018 International Working Group for MDS and the European LeukemiaNet for AML. Secondary endpoints include safety, duration of response, progression-free survival and overall survival. In addition, pending the results of IMpress, we plan to support a Phase 1/2 investigator-led study in relapsed/refractory AML using a combination approach of imetelstat and venetoclax or azacitidine.

Research Programs

Preclinical Lymphoid Hematologic Malignancy Program

Academic research data suggests that certain lymphoid hematologic malignancies have higher telomerase activity and shorter telomeres when compared to normal healthy cells. Thus, we believe a telomerase inhibition approach may find utility in this disease setting.

Based on this scientific hypothesis, we initiated a preclinical research project with MD Anderson Cancer Center to determine the potential application of imetelstat in lymphoid hematologic malignancies. Preliminary results from this research were published in *Blood* in November 2022. Based on early results, we plan to collaborate further with MD Anderson Cancer Center to conduct preclinical research to assess the potential therapeutic effect of imetelstat in lymphoid malignancies.

Next Generation Telomerase Inhibitor Discovery Program

We have initiated a discovery program to identify a lead compound as a potential next generation oral telomerase inhibitor. If such a compound is identified, we plan to conduct preclinical experiments that may serve as a basis for potential future clinical testing. Discovery research is an uncertain and unpredictable process. As such, the timing and nature of any results from this discovery effort are difficult to forecast. If we select a lead compound from this discovery program, we expect to provide an update on our efforts at that time.

Impact of COVID-19 on Our Business

The ongoing COVID-19 pandemic is having widespread, continually evolving, and unpredictable impacts on global societies, economies, financial markets, and business practices. We are closely monitoring the impact of the pandemic, the identification of new variants of the COVID-19 virus and related developments, and our focus remains on promoting employee health and safety while continuing to advance the development of imetelstat. All plans and timing expectations will be delayed or interrupted if COVID-19 pandemic conditions worsen, creating further limitations on our clinical trial and other development activities. For discussion regarding the impact of the COVID-19 pandemic on our business and financial results, see the sub-section entitled "Risks Related to COVID-19" under "Risk Factors" in Part I, Item 1A and Note 6 on Commitments and Contingencies – Risks Related to Global Economic Conditions, COVID-19 and the Military Conflict Between Ukraine and Russia in Notes to Consolidated Financial Statements of this annual report on Form 10-K.

Intellectual Property and Exclusivity

Intellectual property, including patent protection, is very important to our business. We file patent applications in the U.S. and other jurisdictions, and we also rely on trade secret protection and contractual arrangements to protect aspects of our business. An enforceable patent with appropriate claim coverage can provide an advantage over competitors who may seek to employ similar approaches to develop therapeutics, and so the future commercial success of imetelstat, and therefore our future success, will be in part dependent on our intellectual property strategy. The information provided in this section should be reviewed in the context of the section entitled "Risks Related to Protecting Our Intellectual Property" described in "Risk Factors" in Part I, Item 1A of this annual report on Form 10-K.

Our intellectual property strategy includes the early development of a technology, such as imetelstat, followed by rounds of increasingly focused innovation around a product opportunity, including identification and definition of a specific product candidate and uses thereof, manufacturing processes, product formulation and methods of treatment and administration. The result of this process is that products in development are often protected by several families of patent filings that are filed at different times during the development process and cover different aspects of the product. Consequently, earlier filed, broad technology patents will usually expire ahead of patents covering later developments, such as product formulations and methods of treatment and administration, so that patent expirations on a product may span several years. Patent coverage may also vary from country to country based on the scope of available patent protection. There are also opportunities to obtain an extension of patent coverage for a product in certain countries, which adds further complexity to the determination of patent life.

From time to time, we may endeavor to monitor worldwide patent filings by third parties that are relevant to our business. Based on this monitoring, we may determine that an action is appropriate to protect our business interests. Such actions may include negotiating patent licenses where appropriate, filing oppositions against a patent, filing a request for post grant review against a patent or filing a request for the declaration of an interference with a patent application or issued patent.

Imetelstat

We have global rights to imetelstat. We own issued patents related to imetelstat in the U.S., Europe and other countries. Composition of matter patents generally provide the most material coverage, and therefore may convey competitive advantages. Because imetelstat is still under development, subsequent innovation and associated patent filings may provide additional patent coverage with later expiration dates. Examination of overseas patent applications typically lags behind U.S. examination, particularly where cases are filed first in the U.S. It may be possible to obtain patent term extensions of some patents in some countries for claims covering imetelstat, which could further extend the patent term.

We have issued U.S. and European patents that provide patent coverage into 2033 pertaining to the treatment of MF and MDS with imetelstat. We also hold issued U.S. and European patents covering imetelstat composition of matter.

In the U.S., our composition of matter patent coverage extends until December 2025, and our method of treatment patent rights for MDS and MF expire in March 2033. Under the Hatch-Waxman Act, upon receipt of drug product approval, potential patent term extensions, if any, may be available to extend the patent term of either our composition of matter patent, or our method of treatment patent for MDS, in the U.S.

In Europe, our composition of matter patent coverage expires in September 2024, and our method of treatment patent rights for MDS and MF expire in November 2033 in member countries of the European Patent Convention. One of our patents in each member country of the European Patent Convention may be eligible for patent term extension under the European SPC Regulation, upon receipt of drug product approval, such as, for example, our method of treatment patent for MDS. Our patent rights relating to imetelstat also include reagents useful in manufacturing processes for the drug, and method of treatment and kit claims, certain of which are co-owned with other entities.

If regulatory approval of imetelstat occurs after a patent has expired, we may be unable to obtain any patent term extension of that expired patent, and the scope of our patent rights will be limited. In addition, should we seek such a patent term extension, we may not be granted any such patent term extension and/or the applicable time period of such patent term extension could be less than five years. Moreover, in some countries, including the U.S., the scope of protection for claims under such patent term extensions, if any, does not extend to the full scope of the claims but is limited to the product composition as approved. Thus, if we were to receive drug product approval in the U.S. for imetelstat in lower risk MDS in the first half of 2024, we may potentially extend the term of our product composition claims in the U.S. for a maximum of five years until December 2030, subject to U.S. Patent and Trademark Office, or USPTO, approval. If we do not receive a patent term extension for our U.S. composition of matter patent for imetelstat, our U.S. composition of matter patent will expire in December 2025. If we do not receive marketing approval and submit a request for an SPC before our composition of matter patents expire in countries of the European Economic Area, or EEA, our imetelstat composition of matter patents will expire in September 2024. If we receive drug product approval in Europe for imetelstat in lower risk MDS in the second half of 2024, we may potentially extend the term of our patents in the EEA for the method of treatment of MDS for a maximum of five years, from November 2033 until November 2038, subject to European Patent Office approval. If we do not have sufficient patent life to protect imetelstat, our financial results, business and business prospects, and the future of imetelstat would be materially and adversely affected, which might cause us to cease operations.

Upon the effective date of termination of the license and collaboration agreement, or the Collaboration Agreement, with Janssen Biotech, Inc., or Janssen, on September 28, 2018, we regained global rights to imetelstat and are continuing development of imetelstat on our own. In accordance with the termination provisions of the Collaboration Agreement, we have an exclusive worldwide license for intellectual property developed under the Collaboration Agreement for the further development of imetelstat, without any economic obligations to Janssen with respect to such license. Janssen has assigned to us certain intellectual property developed by it under the Collaboration Agreement. We now are responsible for the costs of maintaining, prosecuting and litigating all imetelstat intellectual property that we own.

Market Exclusivity and Orphan Drug Designation

For a drug to qualify for orphan drug designation by the FDA, both the drug and the disease or condition must meet certain criteria specified in the Orphan Drug Act, or ODA, and FDA's implementing regulations. Orphan drug designation is granted by the FDA's Office of Orphan Drug Products in order to support development of medicines for underserved or rare diseases and patient populations that affect fewer than 200,000 people in the U.S. or, if the disease or condition affects more than 200,000 individuals annually in the U.S., if there is no reasonable expectation that the cost of developing and making the drug would be recovered from sales in the U.S. Orphan drug designation qualifies the sponsor of the drug for various development incentives of the ODA, including, if regulatory approval is received, the potential for seven years of market exclusivity with certain limited exceptions and certain tax credits for qualified clinical testing. A marketing application for a prescription drug product that has received orphan drug designation is not subject to a prescription drug user fee unless the application includes an indication for a disease or condition other than the rare disease or condition for which the drug was granted orphan drug designation. The granting of orphan drug designation does not alter the standard regulatory requirements and process for obtaining marketing approval. The safety and effectiveness of a drug must be established through adequate and well-controlled studies. Orphan drug exclusivity does not prevent the FDA from approving a different drug for the same disease or condition, or the same drug for a different disease or condition.

In June 2015 and December 2015, the FDA granted orphan drug designation to imetelstat for the treatment of MF and MDS, respectively.

In the U.S., under the Hatch-Waxman Act, upon drug product approval a new chemical entity is entitled to four years of data exclusivity and one year of market exclusivity, conferring a total of five years exclusivity, or NCE exclusivity, for the first-approved indication. Thus, if we receive drug product approval for imetelstat in lower risk MDS in the first half of 2024, we expect that we may receive exclusivity in lower risk MDS under the Hatch-Waxman Act until the first half of 2029. In addition, under the Orphan Drug Act of 1983, orphan drug designation confers market exclusivity in the designated indication for seven years after drug product approval. Thus, if we

receive drug product approval for imetelstat in the U.S. for imetelstat in lower risk MDS in the first half of 2024, we anticipate that we may receive market exclusivity under the Orphan Drug Act of 1982 in the U.S. until the first half of 2031.

In addition, a six-month pediatric extension may be available in the U.S. pursuant to the Food and Drug Administration Safety and Innovation Act of 2012, or FDASIA, to the longest extension or exclusivity period available under any of a patent term extension, the NCE exclusivity period or the orphan drug exclusivity period.

In Europe, orphan drug designation by the European Commission provides regulatory and financial incentives for companies to develop and market therapies that treat a life-threatening or chronically debilitating condition affecting no more than five in 10,000 persons in the European Union, or EU, and where no satisfactory treatment is available. In the EU, orphan drug designation also entitles a party to financial incentives such as reduction of fees or fee waivers, as well as protocol assistance from the EMA during the product development phase, and direct access to the centralized authorization procedure. In addition, ten years of market exclusivity is granted following drug product approval, meaning that another application for marketing authorization of a later similar medicinal product for the same therapeutic indication will generally not be approved in the EU. This period may be reduced to six years if the orphan drug designation criteria are no longer met, including where it is shown that the product is sufficiently profitable to not justify maintenance of market exclusivity.

In December 2015 and July 2020, the EMA granted orphan drug designation to imetelstat for the treatment of MF and MDS, respectively.

In Europe, under the European Union Data Exclusivity Directive 2004/27/EC, upon drug product approval a new medicinal product is entitled to eight years of data exclusivity and two years of market exclusivity, conferring a total of ten years of exclusivity for the first-approved indication. Thus, if we receive drug product approval in Europe for imetelstat in lower risk MDS in the second half of 2024, we anticipate receiving a total of ten years of exclusivity for lower risk MDS, until the second half of 2034. Separately, orphan drug designation under the European Union Orphan drug regulation (EC) No. 141/2000 confers market exclusivity for ten years following drug product approval for each of the orphan disease indications. Thus, if we receive drug product approval in Europe for imetelstat in lower risk MDS in the second half of 2024 and we maintain orphan drug designation, we anticipate that we may receive market exclusivity in Europe for imetelstat in lower risk MDS until the second half of 2034. In addition, if we fulfill the pediatric investigation plan agreed upon with the European Medicines Agency, such market exclusivity may be extended for an additional two years under the European Pediatric Regulation, which may enable us to receive market exclusivity in Europe for imetelstat in lower risk MDS for an additional two years, until the second half of 2036. Further, if we receive drug product approval in Europe for imetelstat for refractory MF, and we maintain orphan drug designation, we anticipate that we may receive ten years exclusivity in Europe for refractory MF following drug product approval, if any.

Fast Track Designation

Fast Track designation provides opportunities for frequent interactions with FDA review staff, as well as eligibility for priority review, if relevant criteria are met, and rolling review. Fast Track designation is intended to facilitate and expedite development and review of an NDA to address unmet medical needs in the treatment of serious or life-threatening conditions. However, Fast Track designation does not accelerate conduct of clinical trials or mean that the regulatory requirements are less stringent, nor does it ensure that imetelstat will receive marketing approval or that approval will be granted within any particular timeframe. In addition, the FDA may withdraw Fast Track designation if it believes that the designation is no longer supported by data emerging from the imetelstat clinical development program.

In October 2017, the FDA granted Fast Track designation to imetelstat for the treatment of adult patients with transfusion-dependent anemia due to Low or Intermediate-1 risk MDS who are non-del(5q) and who are refractory or resistant to treatment with an ESA.

In September 2019, the FDA granted Fast Track designation to imetelstat for the treatment of adult patients with relapsed/refractory MF.

Licensing

In September 2016, we granted a license to Janssen Pharmaceuticals, Inc., or Janssen Pharmaceuticals, an affiliate of Janssen, for the research, development and commercialization of products based on specialized oligonucleotide backbone chemistry and novel amidates for disorders, excluding cancers originating from the blood or bone marrow. In connection with this license, we also granted to Janssen Pharmaceuticals a non-exclusive

worldwide license under our patent rights covering the synthesis of monomers, which are the building blocks of oligonucleotides. Janssen Pharmaceuticals has terminated the license, and termination was effective as of April 12, 2021. Upon the effective date of termination, all patent rights originally conveyed under the license reverted to Geron.

We previously granted patent licenses to a number of other organizations to utilize aspects of our technologies to develop and commercialize products outside of the imetelstat program; however, all of our patent license agreements related to our telomerase technology have now expired or been terminated, and we expect no further revenue under such agreements in the future.

See "Management's Discussion and Analysis of Financial Condition and Results of Operations—Revenues" included in Part II, Item 7, of this annual report on Form 10-K for a further discussion of revenues from our license agreements.

Manufacturing

A typical sequence of steps in the manufacture of imetelstat drug product includes the following key components:

- starting materials, which are well-defined raw materials that are used to make bulk drug substance;
- bulk drug substance, which is the active pharmaceutical ingredient in a drug product that provides pharmacological activity or other direct effect in the treatment of disease; and
- final drug product, which is the finished dosage form that contains the drug substance that is shipped to the clinic for patient treatment.

Since September 2018, we have engaged third-party contract manufacturers and have re-established our own manufacturing supply chain to manufacture and supply additional quantities of imetelstat that meet applicable regulatory standards for current and potential future clinical trials and potential commercial uses.

We do not have direct control over third-party personnel or operations. These third-party contract manufacturers, and/or any other third parties that we may rely upon for the manufacture and/or supply of imetelstat, typically complete their services on a proposal by proposal basis under master supply agreements and may need to make substantial investments to enable sufficient capacity increases and cost reductions, and to implement those regulatory and compliance standards necessary for successful Phase 3 clinical trials and commercial production. These third-party contract manufacturers, and/or any other third parties that we may rely upon for the manufacture and/or supply of imetelstat, may not be able to achieve such capacity increases, cost reductions, or regulatory and compliance standards, and even if they do, such achievements may not be at a commercially reasonable cost. We are responsible for establishing any long-term commitments or commercial supply agreements with any of the third-party contract manufacturers for imetelstat. The information provided in this section should be reviewed in the context of the section entitled "Risks Related to Manufacturing Imetelstat" under Part I, Item 1A, "Risk Factors" of this annual report on Form 10-K.

Competition

The pharmaceutical and biotechnology industries are characterized by intense and dynamic competition with rapidly advancing technologies and a strong emphasis on proprietary products. While we believe our proprietary oligonucleotide chemistry; experience with the biological mechanisms related to imetelstat, telomeres and telomerase; clinical data to date indicating potential disease-modifying activity with imetelstat treatment; and knowledge and expertise around the development of potential treatments for myeloid hematologic malignancies provide us with competitive advantages, we face competition from many different sources, including major pharmaceutical, specialty pharmaceutical and biotechnology companies, academic institutions, governmental agencies, and public and private research institutions. Imetelstat will compete, if approved, with other products and therapies that currently exist, are being developed or will in the future be developed, some of which we may not currently be aware of.

Competition in Lower Risk MDS

The current standard of care for the treatment of lower risk MDS is the use of ESAs to address the patient's chronic anemia. Once ESAs are no longer effective, serial blood transfusions are often administered that can cause damaging effects to other organs due to iron overload, resulting in shorter survival. In addition, other best available therapies are used without durable effect for the patient.

In lower risk MDS, positive top-line results from IMerge Phase 3 describe potentially meaningful and durable transfusion independence, activity across MDS patient subtypes, and potential disease-modifying activity achievable with imetelstat treatment. We believe that these key features are differentiators compared to currently approved products as well as investigational drugs currently in clinical development.

If approved for commercial sale for the treatment of lower risk MDS, imetelstat would compete against a number of currently existing therapies, including ESAs and other hematopoietic growth factors that are indicated for anemia; immunomodulators, such as Revlimid (lenalidomide) by Celgene Corporation, a Bristol-Myers Squibb Corporation, or Celgene; hypomethylating agents, such as Vidaza (azacitidine) by Celgene and manufacturers of generic azacitidine; Dacogen (decitabine) by Otsuka America Pharmaceutical, Inc. and other manufacturers in the U.S. and Janssen in the EU; Inqovi (oral combination of decitabine and cedazuridine) by Astex Pharmaceuticals, Inc., or Astex; and Reblozyl (luspatercept), a TGF-beta inhibitor, by Acceleron Pharma, Inc., or Acceleron (acquired by Merck & Co., Inc., or Merck, in November 2021), in collaboration with Celgene. In November 2022, Bristol-Myers Squibb Company, or BMS, announced that the Phase 3 front-line COMMANDS trial that compared Reblozyl (luspatercept) to ESAs was positive and that data would be presented in 2023 at a major medical meeting.

Other therapies currently in Phase 3 development in lower risk MDS, some of which may obtain regulatory approval earlier than imetelstat include roxadustat, a hypoxia-inducible factor prolyl hydroxylase inhibitor, by FibroGen, Inc; Onureg (oral azacytidine) by Bristol-Myers Squibb Corporation, or BMS; and Hengqu (hetrombopag), an oral nonpeptide thrombopoietin receptor agonist, by Jiangsu Hengrui Pharmaceuticals Co., Ltd.

In addition, there are multiple Phase 1 and Phase 2 clinical trials of other agents being developed for lower risk MDS, including but not limited to: LB-100, a PP2A inhibitor, by Lixte Biotechnology Holdings, Inc.; bemcentinib, an AXL inhibitor, by BerGenBio ASA; H3B-8800, a spliceosome inhibitor, by H3 Biomedicine, Inc.; KER-050, a TGF-beta inhibitor, by Keros Therapeutics, Inc., or Keros Therapeutics; TP-0184, an inhibitor of ALK2 or ACVR1 kinase, by Sumitomo Dainippon Pharma Oncology, Inc; ilginatinib (NS-018), a JAK2 inhibitor, by NS Pharma, Inc., a U.S. subsidiary of Nippon Shinyaku Co., Ltd., or NS Pharma; RVT-2001, a SF3B1 modulator, by Roivant Sciences, Ltd.; sabatolimab (MBG453), a TIM-3 inhibitor, by Novartis AG; a lower dose of ASTX727, an oral formulation of decitabine and cedazuridine, referred to as ASTX727 LD, by Astex; ASTX030, an oral formulation of azacitidine and cedazuridine, by Astex; R289, an oral inhibitor of interleukin receptor-associated kinases 1 and 4, or IRAK1/4, by Rigel Pharmaceuticals, Inc.; a combination treatment regimen of luspatercept and lenalidomide by BMS; and HuMax-IL8 (BMS-986253), an anti-IL-8 monoclonal antibody, by BMS and etavopivat, an oral, small molecule activator of erythrocyte pyruvate kinase (PKR) by Forma Therapeutics, Inc., a Novo Nordisk Company; canakinumab, an interleukin antagonist, by Novartis AG; and AG946, a next-generation pyruvate kinase-R (PKR) activator, by Agios Pharmaceuticals, Inc.

Competition in Relapsed/Refractory MF

The current standard of care for the treatment of Intermediate-2 or High-risk MF is the use of JAK inhibitors, to address the patient's symptoms. Once JAK inhibitors fail or are no longer effective, a variety of best available therapies are used since there are no approved treatments for this patient population and median OS is 14 – 16 months after discontinuation from the predominant JAK inhibitor being used today.

In Intermediate-2 or High-risk relapsed/refractory MF, data from IMbark suggest potential disease-modifying activity with imetelstat treatment and a potential meaningful improvement in OS, which is supported in a comparison to real-world data.

If approved for commercial sale for the treatment of MF, imetelstat would compete against currently approved JAK inhibitors: Jakafi (ruxolitinib) by Incyte Corporation, or Incyte, and Inrebic (fedratinib) by Celgene, as well as a kinase inhibitor, Vonjo (pacritinib), by CTI Biopharma Corp., which was approved in February 2022 for the treatment of adults with Intermediate or High-Risk primary or secondary myelofibrosis with a platelet count below 50 × 109/L. Other treatment modalities for MF include hydroxyurea for the management of splenomegaly, leukocytosis, thrombocytosis and constitutional symptoms; splenectomy and splenic irradiation for the management of splenomegaly and co-existing cytopenias; chemotherapy; and pegylated interferon. Drugs for the treatment of MF-associated anemia include ESAs, androgens, danazol, corticosteroids, thalidomide and lenalidomide.

Other therapies currently in Phase 3 development in MF, some of which may obtain regulatory approval earlier than imetelstat, include momelotinib, a JAK inhibitor, by GlaxoSmithKline plc; or momelotinib plus AZD5153, a BET inhibitor by GlaxoSmithKline plc; pelabresib (CPI-0610), a BET inhibitor, by MorphoSys AG; navitoclax, a BCLXL, BCL-2 and BCLW inhibitor, by AbbVie, Inc.; and parsaclisib, a PI3K delta inhibitor, by Incyte. Other approaches for MF currently under investigation that could compete with imetelstat in the future include luspatercept; zinpentraxin alfa (RG6354, formerly PRM-151), an anti-fibrosis antibody, by F. Hoffmann-La

Roche, Ltd.; LCL-161, an inhibitor of apoptosis protein (IAP), by Novartis; KRT-232, an inhibitor of MDM2, by Kartos Therapeutics, Inc.; GB2064, a LOXL2 inhibitor, by Galecto Biotech; elraglusib (9-ING-41), a glycogen synthase kinase-3 beta inhibitor, by Actuate Therapeutics, Inc.; XPOVIO (selinexor), a nuclear export inhibitor, by Karyopharm Therapeutics, Inc.; TL-895, an oral tyrosine kinase inhibitor, by Telios Pharma, Inc.; IMG-7289, a LSD1 inhibitor, by Imago Biosciences, Inc.; APG-1252, a dual BCL-2/BCL-XL inhibitor, by Ascentage Pharma; ilginatinib (NS-018), a JAK2 inhibitor by NS Pharma; DISC-0974, a monoclonal antibody against hemojuvelin (HJV) by DISC Management Inc.; KER-050 in combination with ruxolitinib, by Keros Therapeutics; CK0804, an allogeneic T-regulatory cell agent, by Cellenkos, Inc. in collaboration with Incyte; TP-3654, PIM kinase inhibitor by Sumitomo Pharma Co., Ltd.; and a mutated-CALR vaccine, a peptide-based vaccine, from the Icahn School of Medicine at Mount Sinai.

Many of our competitors, either alone or with their strategic partners, could have substantially greater financial, technical and human resources than we do and significantly greater experience in obtaining FDA and other regulatory approvals of treatments and commercializing those treatments. We believe that the commercial success of imetelstat is subject to a number of factors, including: product efficacy and safety; method of product administration; cost of manufacturing; the timing and scope of regulatory consents; status of coverage and reimbursement; price; the level of generic competition; and our patent position.

Smaller companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. We anticipate increased competition in the future as new companies explore treatments for myeloid hematologic malignancies, which may significantly impact the commercial viability of imetelstat. Academic institutions, government agencies and other public and private research organizations may also conduct research, seek patent protection and establish collaborative arrangements for research, clinical development and marketing of products similar to imetelstat. These companies and institutions compete with us in recruiting and retaining qualified development and management personnel as well as in acquiring technologies complementary to the imetelstat program.

As a result of the foregoing, competitors may develop more commercially desirable or affordable products than imetelstat, or achieve earlier patent protection or product commercialization than we may be able to achieve with imetelstat. Competitors have developed, or are in the process of developing, technologies that are, or in the future may be, competitive to imetelstat. Some of these products may have an entirely different approach or means of accomplishing therapeutic effects similar or superior to those that may be demonstrated by imetelstat. Competitors may develop products that are safer, more effective, or less costly than imetelstat, or more convenient to administer to patients and, therefore, present a serious competitive threat to imetelstat. In addition, competitors may price their products below what we may determine to be an acceptable price for imetelstat, may receive better third-party payor coverage and/or reimbursement, or may be more cost-effective than imetelstat. Such competitive products or activities by competitors may render imetelstat obsolete, which may cause us to cease any further development or future commercialization of imetelstat, which would severely and adversely affect our financial results, business and business prospects, and the future of imetelstat, and might cause us to cease operations.

Government Regulation

Regulation by governmental authorities in the U.S. and other countries is a significant factor in the development, manufacture and potential future marketing of imetelstat. Imetelstat will require regulatory approval by governmental agencies prior to commercialization. In particular, potential human therapeutic products, such as imetelstat, are subject to rigorous preclinical and clinical testing and other approval procedures of the FDA and similar regulatory authorities in European and other countries. Various governmental statutes and regulations also govern or influence testing, manufacturing, safety, labeling, storage, import, export, distribution and recordkeeping related to such products and their marketing. The process of obtaining these approvals and the subsequent compliance with appropriate statutes and regulations require the expenditure of substantial time and money, and there can be no guarantee that approvals will be granted. Moreover, compliance with government regulations governing personal information and information security requires the expenditure of substantial time and financial resources. The information provided in this section should be reviewed in the context of the sections entitled “Risks Related to the Development of Imetelstat” and “Risks Related to Regulatory Compliance Matters and Commercialization of Imetelstat” under Part I, Item 1A, “Risk Factors” of this annual report on Form 10-K.

United States Food and Drug Administration Regulatory Approval Process

Prior to commencement of clinical trials involving humans, preclinical testing of new pharmaceutical products is generally conducted on animals in the laboratory to evaluate the potential efficacy and safety of a product candidate. The results of these trials are submitted to the FDA as part of an Investigational New Drug, or IND, application, which must become effective before clinical testing in humans can begin. The FDA can place an IND

on clinical hold at any time, which prevents the conduct of clinical trials under the IND until safety concerns or questions are addressed by the IND sponsor to the FDA's satisfaction.

Typically, clinical evaluation involves a time consuming and costly three phase trial process. In Phase 1, clinical trials are conducted with a small number of healthy volunteers or patients afflicted with a specific disease to assess safety and to evaluate the pattern of drug distribution and metabolism within the body. In Phase 2, clinical trials are conducted with groups of patients afflicted with a specific disease in order to determine preliminary efficacy, optimal dosages and expanded evidence of safety. The Phase 2 trials can be conducted comparing the investigational treatment to a comparator arm, or not. If used, a comparator usually includes standard of care therapy. Safety and efficacy data from Phase 2 clinical trials, even if favorable, may not provide sufficient rationale for proceeding to a Phase 3 clinical trial. In Phase 3, large scale, multi-center, comparative trials are conducted with patients afflicted with a target disease to provide sufficient data to demonstrate the efficacy and safety required by the FDA. The FDA closely monitors the progress of each of the three phases of clinical testing and may, at its discretion, re-evaluate, alter, suspend, or terminate the trials. Human clinical trials must be conducted in compliance with Good Clinical Practice, or GCP, regulations and applicable laws, with the oversight of Institutional Review Boards for the protection of human subjects. The manufacture of drug product candidates is subject to requirements that drugs be manufactured, packaged and labeled in conformity with current Good Manufacturing Practices, or cGMP, and applicable laws.

The results of the preclinical and clinical testing of drugs and complete manufacturing information are submitted to the FDA in the form of an NDA for review and approval prior to commencement of commercial sales. Submission of an NDA requires the payment of a substantial user fee to the FDA, which may be waived in certain cases. In responding to an NDA submission, the FDA may approve the drug for commercialization, impose limitations on its indications for use and labeling, including in the form of Risk Evaluation and Mitigation Strategies or may issue a complete response letter. Even if an NDA is approved, its sponsor is subject to ongoing and pervasive regulatory compliance requirements.

European and Other Regulatory Approval Process

Prior to initiating clinical trials in a region outside of the U.S., a clinical trial application must be submitted and reviewed by the appropriate regulatory authority regulating the country in which the trial will be conducted. Whether or not FDA clearance or approval has been obtained, approval of a product by comparable regulatory authorities in Europe and other countries is necessary prior to commencement of marketing the product in such countries. The regulatory authorities in each country may impose their own requirements and may refuse to grant an approval, or may require additional data before granting it, even though the relevant product has been cleared or approved by the FDA or another authority. As with the FDA, the regulatory authorities in the EU and other developed countries have lengthy approval processes for pharmaceutical products. The process for gaining approval in particular countries varies, but generally follows a similar sequence to that described for FDA approval. In Europe, the European Medicine Agency, or EMA, and the European Committee for Proprietary Medicinal Products for Human Use, or CHMP, provide a mechanism for EU member states to exchange information on all aspects of product licensing. The EU has established the EMA for the evaluation of medical products, with a centralized procedure which is mandatory for orphan and oncology products and which grants a single marketing authorization valid in all EU member states.

In October 2021, we gained access to the Innovative Licensing and Access Pathway, or ILAP, through the receipt of an Innovation Passport for imetelstat to treat lower risk MDS. The ILAP is a new program sponsored by the Medicines and Healthcare products Regulatory Agency, or MHRA, in the U.K. post-Brexit. The objective of this new licensing and access pathway is to reduce the time to market and enable earlier patient access for innovative medicines. The Innovation Passport is the first prescribed entry point in the ILAP process. Key benefits of being within ILAP include a 150-day accelerated assessment and rolling review of an MAA, as well as opportunities for frequent interactions with the review staff at the MHRA and its partner agencies to discuss imetelstat's development, regulatory and reimbursement plans.

Fraud and Abuse, Data Privacy and Security, and Transparency Laws and Regulations

We may also be subject to additional regulation and enforcement by the federal government and by authorities in the states and foreign jurisdictions in which we conduct our business. These additional regulations could affect our current and future arrangements with healthcare professionals, principal investigators, consultants, customers and third-party payors. Such laws include, without limitation, state and federal anti-kickback, fraud and abuse, false claims, privacy and security, and healthcare professionals payment sunshine laws.

The federal Anti-Kickback Statute makes it illegal for any person or entity, including a prescription drug manufacturer (or a party acting on its behalf) to knowingly and willfully, directly or indirectly, solicit, receive, offer, or pay any remuneration that is intended to induce the referral of business, including the purchase, order, or lease of any good, facility, item or service for which payment may be made under a federal healthcare program, such as Medicare or Medicaid. The term "remuneration" has been broadly interpreted to include anything of value. Several courts have interpreted the statute's intent requirement to mean that if any one purpose of an arrangement involving remuneration is to induce referrals of federal healthcare covered business, the Anti-Kickback Statute has been violated. The Patient Protection and Affordable Care Act of 2010, as amended by the Health Care and Education Reconciliation Act, collectively the Affordable Care Act or ACA, among other things, amended the intent requirement of the federal Anti-Kickback Statute such that a person or entity no longer needs to have actual knowledge of the statute or specific intent to violate, in order to commit a violation.

Federal civil and criminal false claims and false statement laws, including the federal civil False Claims Act and its whistleblower or *qui tam* provisions that permit private individuals to bring an action on behalf of the government to enforce the civil False Claims Act, prohibit, among other things, any person or entity from knowingly presenting, or causing to be presented, for payment to, or approval by, federal programs, including Medicare and Medicaid, claims for items or services, including drugs, that are false or fraudulent or not provided as claimed. Entities can be held liable under these laws if they are deemed to "cause" the submission of false or fraudulent claims by, for example, providing inaccurate billing or coding information to customers, promoting a product off-label, or for providing medically unnecessary services or items. In addition, a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the federal civil False Claims Act. Criminal prosecution is also possible for making or presenting a false, fictitious or fraudulent claim to the federal government.

The federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, created criminal and civil liability for, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, including private third-party payors, knowingly and willfully embezzling or stealing from a healthcare benefit program, willfully obstructing a criminal investigation of a healthcare offense, and knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for healthcare benefits, items or services.

HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, or HITECH, and their implementing regulations, imposes obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security, transmission and breach reporting of individually identifiable health information, upon entities subject to the law, such as health plans, healthcare clearinghouses and certain healthcare providers and their respective business associates and their subcontractors that perform services for them that involve individually identifiable health information. HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in U.S. federal courts to enforce the federal HIPAA laws and seek attorneys' fees and costs associated with pursuing federal civil actions.

The federal Physician Payments Sunshine Act requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program, with specific exceptions, to report annually to the Centers for Medicare & Medicaid Services, or CMS, information related to payments or other transfers of value made to physicians (defined to include doctors, dentists, optometrists, podiatrists, and chiropractors), other healthcare professionals (such as physicians assistants and nurse practitioners), and teaching hospitals, and applicable manufacturers and applicable group purchasing organizations to report annually to CMS ownership and investment interests held by physicians and their immediate family members.

Analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers. Additionally, we may be subject to state laws that require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government. Further, we may be subject to state laws that require drug manufacturers to report information related to payments and other transfers of value to physicians, other healthcare providers and healthcare entities, or marketing expenditures, as well as state and local laws that require the registration of pharmaceutical sales representatives; state laws that require the reporting of information related to drug pricing; and state, federal and foreign laws governing the privacy and security of personal information (including key-coded data and health information), including the European Union's General

Data Protection Regulation, or EU GDPR, many of which differ from each other in significant ways, thus complicating compliance efforts.

Efforts to ensure that our current and future business arrangements will comply with applicable privacy and data security laws and regulations will involve substantial costs. For example, foreign data privacy and security laws (including but not limited to the EU GDPR and UK GDPR) impose significant and complex compliance obligations on entities that are subject to those laws. As one example, the EU GDPR imposes heightened and codified standards for data subject consent, requiring the implementation and maintenance of technical and organizational safeguards for personal data, mandating data breach notifications to relevant supervisory authority(ies), and mandating the appointment of representatives in the UK and/or the EU in certain circumstances. Foreign privacy laws, such as the EU GDPR, also impose strict rules on the transfer of personal data out of the applicable jurisdiction. Further, the EU GDPR provides for significant penalties (such as restrictions or prohibitions on personal data processing) and large fines for noncompliance, including the potential for fines of up to €20 million or 4% of the annual global revenues of the noncompliant company, whichever is greater. Moreover, we expect that there will continue to be new proposed privacy laws, regulations and industry standards in the U.S. As one example, the California Consumer Privacy Act of 2018, or CCPA, imposes numerous obligations on covered business. Although the CCPA exempts certain data processed in the context of clinical trials, the CCPA, to the extent applicable to our business and operations, may increase our compliance costs and potential liability with respect to the personal information we maintain about California residents. See the section titled "*We are subject to stringent and changing obligations related to data privacy and security. Our actual or perceived failure to comply with such obligations could lead to regulatory investigations and actions; litigation; fines and penalties; disruptions to our business operations; reputational harm; loss of revenue and profits; and other adverse business impacts,"* under "Risk Factors" in Part I, Item 1A of this annual report on Form 10-K for additional information about the laws and regulations to which we may become subject and about the risks to our business associated with such laws and regulations.

If our operations are found to be in violation of any of these or any other healthcare, information security and privacy-related regulatory laws that may apply to us, we may be subject to significant penalties, including the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, disgorgement, imprisonment, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, reputational harm, diminished profits and future earnings, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations. Defending against any such actions can be costly, time-consuming and may require significant financial and personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired.

Reimbursement and Healthcare Reform

Significant uncertainty exists as to the coverage and reimbursement status of any product candidate that receives regulatory approval. In the U.S. and markets in other countries, sales of imetelstat, if approved for commercial sale, will depend, in part, on the extent to which third-party payors provide coverage and establish adequate reimbursement levels for imetelstat.

In the U.S., third-party payors include federal and state healthcare programs, government authorities, private managed care providers, private health insurers and other organizations. There has been increasing legislative and enforcement interest in the U.S. with respect to specialty drug pricing practices. Specifically, there have been several recent U.S. Congressional inquiries, Presidential executive orders, and federal and state legislative activity designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, reduce the cost of drugs under Medicare, and reform government program reimbursement methodologies for drugs. At the federal level, in July 2021, the Biden administration released an executive order, "Promoting Competition in the American Economy," with multiple provisions aimed at prescription drugs. In response to Biden's executive order, on September 9, 2021, HHS released a Comprehensive Plan for Addressing High Drug Prices that outlines principles for drug pricing reform and sets out a variety of potential legislative policies that Congress could pursue to advance these principles. On August 16, 2022, President Biden signed the Inflation Reduction Act of 2022, or IRA, into law, which, among other things, (i) directs HHS to negotiate the price of certain high-expenditure, single-source drugs and biologics covered under Medicare, and subject drug manufacturers to civil monetary penalties and a potential excise tax by offering a price that is not equal to or less than the negotiated "maximum fair price" for such drugs and biologics under the law, and (ii) imposes rebates with respect to certain drugs and biologics covered under Medicare Part B or Medicare Part D to penalize price increases that outpace inflation. The IRA permits HHS to implement many of these provisions through guidance, as opposed to regulation, for the initial years. These provisions will take effect progressively starting in fiscal year 2023, although they may be subject to legal challenges. It is currently unclear how the IRA will be

implemented but is likely to have a significant impact on the pharmaceutical industry. Further, the Biden administration released an additional executive order on October 14, 2022, directing HHS to submit a report on how the Center for Medicare and Medicaid Innovation can be further leveraged to test new models for lowering drug costs for Medicare and Medicaid beneficiaries. It is unclear whether this executive order or similar policy initiatives will be implemented in the future. At the state level, legislatures have increasingly passed legislation and implemented regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, to encourage importation from other countries and bulk purchasing. Further, third-party payors are increasingly challenging the price, examining the medical necessity and reviewing the cost-effectiveness of medical drug products and medical services, in addition to questioning their safety and efficacy. Such payors may limit coverage to specific drug products on an approved list, also known as a formulary, which might not include all of the FDA-approved drugs for a particular indication. We may need to conduct expensive pharmacoeconomic studies in order to demonstrate the medical necessity and cost-effectiveness of imetelstat, in addition to the costs required to obtain the FDA approvals. Nonetheless, imetelstat may not be considered medically necessary or cost-effective.

Moreover, the process for determining whether a third-party payor will provide coverage for a drug product may be separate from the process for setting the price of a drug product or for establishing the reimbursement rate that such a payor will pay for the drug product. A payor's decision to provide coverage for a drug product does not imply that an adequate reimbursement rate will be approved. Further, one payor's determination to provide coverage for a drug product does not assure that other payors will also provide coverage for the drug product, as there is no uniform coverage and reimbursement policy among third-party payors in the U.S. Adequate third-party reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on our investment in imetelstat.

The U.S. and some foreign jurisdictions are considering or have enacted legislative and regulatory proposals to contain healthcare costs, as well as to improve quality and expand access. For example, in March 2010, the ACA was signed into law, which included a number of provisions of importance to the biopharmaceutical industry. There have been judicial and Congressional challenges to certain aspects of the ACA. For example, on June 17, 2021, the U.S. Supreme Court dismissed a challenge on procedural grounds that argued the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress. Further, prior to the U.S. Supreme Court ruling, on January 28, 2021, President Biden issued an executive order that initiated a special enrollment period for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructed certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA. In addition, the IRA, among other things, extends enhanced subsidies for individuals purchasing health insurance coverage in PPACA marketplaces through plan year 2025. The IRA also eliminates the "donut hole" under the Medicare Part D program beginning in 2025 by significantly lowering the beneficiary maximum out-of-pocket cost and creating a new manufacturer discount program. It is possible that the ACA will be subject to judicial or Congressional challenges in the future. It is unclear how such challenges and the healthcare reform measures of the Biden administration will impact the ACA. We expect that other healthcare reform measures that may be adopted in the future may result in more rigorous coverage criteria and lower reimbursement, and additional downward pressure on the price that may be charged for imetelstat.

In addition, other legislative changes have been proposed and adopted since the ACA was enacted. For example, in August 2011, the Budget Control Act of 2011 was enacted, which, among other things, created the Joint Select Committee on Deficit Reduction to recommend to Congress proposals in spending reductions. The Joint Select Committee on Deficit Reduction did not achieve a targeted deficit reduction of at least $1.2 trillion for fiscal years 2012 through 2021, triggering the legislation's automatic reduction to several government programs. This includes aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, which went into effect beginning on April 1, 2013 and, due to subsequent legislative amendments to the statute will stay in effect through 2031 unless additional Congressional action is taken. Under current legislation, the actual reduction in Medicare payments will vary from 1% in 2022 to up to 4% in the final fiscal year of this sequester. Additionally, in January 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals and imaging centers. More recently, there has been heightened governmental scrutiny in the U.S. to control the rising cost of healthcare.

Information About Our Officers

The following table sets forth certain information with respect to our executive officers and other members of management as of January 31, 2023:

Name	Age	Position
Executive Officers		
John A. Scarlett, M.D.	72	President, Chief Executive Officer and Chairman of the Board
Olivia K. Bloom.....	54	Executive Vice President, Finance, Chief Financial Officer and Treasurer
Faye Feller, M.D.	40	Executive Vice President, Chief Medical Officer
Andrew J. Grethlein, Ph.D..	58	Executive Vice President, Chief Operating Officer
Anil Kapur	53	Executive Vice President, Corporate Strategy and Chief Commercial Officer
Other Members of Management		
Melissa A. Kelly Behrs.....	59	Executive Vice President, Business Operations and Chief Alliance Officer
Edward E. Koval.....	60	Executive Vice President, Chief Business Officer
Stephen N. Rosenfield, J.D.	73	Executive Vice President, Chief Legal Officer and Corporate Secretary

John A. Scarlett, M.D., has served as our Chief Executive Officer and a director since September 2011 and President since January 2012 and was appointed to Chairman of the Board in December 2018. Dr. Scarlett served as a director of CytomX Therapeutics, Inc., a biopharmaceutical company focused on developing antibody therapeutics for the treatment of cancer, from June 2016 to June 2022. He was also a director for Chiasma, Inc., a biopharmaceutical company focused on transforming injectable drugs into oral medications, from February 2015 until its acquisition by Amyrt Pharma plc, a biopharmaceutical company, in August 2021. Prior to joining Geron, Dr. Scarlett served as President, Chief Executive Officer and a member of the board of directors of Proteolix, Inc., a privately held, oncology oriented biopharmaceutical company, from February 2009 until its acquisition by Onyx Pharmaceuticals, Inc., an oncology oriented biopharmaceutical company, in November 2009. From February 2002 until its acquisition by Ipsen, S.A. in October 2008, Dr. Scarlett served as the Chief Executive Officer and a member of the board of directors of Tercica, Inc., an endocrinology oriented biopharmaceutical company, and also as its President from February 2002 through February 2007. From March 1993 to May 2001, Dr. Scarlett served as President and Chief Executive Officer of Sensus Drug Development Corporation. In 1995, he co-founded Covance Biotechnology Services, Inc., a contract biopharmaceutical manufacturing operation, and served as a member of its board of directors from inception to 2000. From 1991 to 1993, Dr. Scarlett headed the North American Clinical Development Center and served as Senior Vice President of Medical and Scientific Affairs at Novo Nordisk Pharmaceuticals, Inc., a wholly owned subsidiary of Novo Nordisk A/S. Dr. Scarlett received his B.A. degree in chemistry from Earlham College and his M.D. from the University of Chicago, Pritzker School of Medicine.

Olivia K. Bloom has served as our Executive Vice President, Finance since February 2014, Chief Financial Officer since December 2012 and Treasurer since February 2011. Ms. Bloom previously served as our Senior Vice President, Finance from December 2012 to February 2014, Chief Accounting Officer from September 2010 to December 2012 and Vice President, Finance from January 2007 to December 2012. Ms. Bloom joined the Company in 1994 as a Senior Financial Analyst and from 1996 to 2011 served as our Controller. Prior to joining Geron, Ms. Bloom started her career in public accounting at KPMG Peat Marwick and became a Certified Public Accountant in 1994. Ms. Bloom has served as a member of the board of directors for Personalis, Inc., a genomic sequencing and analytics company supporting the development of personalized therapeutics, since March 2022. Ms. Bloom graduated Phi Beta Kappa with a B.S. in Business Administration from the University of California at Berkeley.

Faye Feller, M.D., has served as our Executive Vice President, Chief Medical Officer since July 2022. Previously, she served as our Vice President of Clinical Development since she joined Geron in April 2019. In this role, Dr. Feller played a strategic role in designing and driving execution of Geron's Phase 3 clinical trials, served as the primary medical point of contact between Geron and our clinical investigators and led the preparation of data for assessment by the data monitoring committees. Dr. Feller's career in the pharmaceutical industry started at Janssen Research and Development, LLC (Janssen) in February 2015. At Janssen, she held several clinical research roles with increasing responsibility, including both Compound Lead and Study Responsible Physician for multiple clinical trials of early and late-stage development assets, including the IMbark Phase 2 clinical trial of imetelstat. Prior to Janssen, Dr. Feller was an instructor in the leukemia department of Memorial Sloan Kettering Cancer Center in New York. She received a B.A. from New York University and an M.D. from Mount Sinai School of Medicine. She completed her residency in internal medicine at Mount Sinai Hospital and her fellowship in medical oncology at Memorial Sloan Kettering Cancer Center.

Andrew J. Grethlein, Ph.D., has served as our Executive Vice President, Chief Operating Officer since January 2019. Previously, he served as our Executive Vice President, Development and Technical Operations, from July 2014 to January 2019. He joined Geron in September 2012 as our Executive Vice President, Technical Operations. Prior to joining Geron, Dr. Grethlein was Executive Vice President and Chief Operating Officer for Inspiration Biopharmaceuticals, a biopharmaceutical company, from January 2010 to September 2012. From October 2008 until January 2010, Dr. Grethlein was Senior Vice President of Biotechnology and Portfolio Management Team Leader for Hematology at Ipsen S.A., a global specialty pharmaceutical company. His responsibilities at Ipsen included planning and execution of worldwide strategy for product and portfolio development in the hematologic therapeutic area. From 2003 to 2008, Dr. Grethlein served as Senior Vice President of Pharmaceutical Operations at Tercica, Inc., an endocrinology-oriented biopharmaceutical company, where he was a member of the senior executive team that governed corporate strategy, business planning and company operations, and had responsibility for all manufacturing and quality functions. Before joining Tercica, Dr. Grethlein served in various positions at Elan Corporation, a biotechnology company, from 1997 to 2003, including as Senior Director, South San Francisco Pharmaceutical Operations. From 1995 to 1997, Dr. Grethlein served as Manager, Biologics Development and Manufacturing, for Athena Neurosciences, Inc., a pharmaceutical company. Prior to this, he served in various engineering positions for the Michigan Biotechnology Institute, a nonprofit technology research and business development corporation. Dr. Grethlein received his A.A. degree in liberal arts from Simon's Rock Early College, his B.S. in biology from Bates College, and his M.S. and Ph.D. in chemical engineering from Michigan State University.

Anil Kapur has served as our Executive Vice President, Corporate Strategy and Chief Commercial Officer since December 2019. Prior to joining Geron, Mr. Kapur was Chief Commercial Officer at Actinium Pharmaceuticals, Inc., a clinical stage biopharmaceutical company, from February 2018 to November 2019. From October 2016 until February 2018, Mr. Kapur was Vice President, Head of Early Assets, Biomarkers and External Innovation for Worldwide Oncology Commercialization at Bristol-Myers Squibb Company, a global biopharmaceutical company. Mr. Kapur served as Vice President, Global Head of Commercial and Portfolio Strategy at Baxalta, Incorporated, a biopharmaceutical company, in a newly created Oncology Division, from November 2015 until after its acquisition by Shire plc in July 2016. Before joining Baxalta, Mr. Kapur held marketing and sales leadership roles of increasing responsibility during his 15-year tenure at the Janssen Pharmaceutical Companies of Johnson & Johnson (Janssen). As Vice President, Commercial Leader, Hematology Franchise in Janssen's Global Commercial Strategy Organization, he led the development and execution of commercial strategy and launch plans for in-market development, late development, and early pipeline assets, including imetelstat. Among Mr. Kapur's most recognized achievements while at Janssen were the successful global launches of two transformational blockbuster hematology-oncology drugs, Imbruvica and Darzalex. Mr. Kapur has served as a member of the board of directors of Verastem, Inc., a development-stage biopharmaceutical company, since October 2022. Mr. Kapur holds a Bachelor of Engineering from Birla Institute of Technology in India; an M.S. in Industrial Engineering from Louisiana Tech University; and an M.B.A. from the Fuqua School of Business at Duke University.

Melissa A. Kelly Behrs has served as our Executive Vice President, Business Operations and Chief Alliance Officer since December 2021. Previously, she was our Executive Vice President, Chief Business Officer from January 2019 to December 2021, Executive Vice President, Business Development and Portfolio & Alliance Management, from February 2014 to January 2019, and our Senior Vice President, Portfolio and Alliance Management from September 2012 to February 2014. Ms. Behrs joined Geron in November 1998 as Director of Corporate Development. Since then, she has also served in various managerial positions, including General Manager, R&D Technologies; Vice President, Corporate Development; Senior Vice President, Therapeutic Development, Oncology; and Senior Vice President, Strategic Portfolio Management. From 1990 to 1998, Ms. Behrs worked at Genetics Institute, Inc., a biotechnology research and development company, serving initially as Assistant Treasurer and then as Associate Director of Preclinical Operations where she was responsible for all business development, regulatory, and project management activities for the Preclinical Development function. Ms. Behrs received a B.S. from Boston College and an M.B.A. from Babson College.

Edward E. Koval has served as our Executive Vice President, Chief Business Officer since December 2021. From 2020 to 2021, he was Chief Business Officer at ZebiAI Therapeutics, a company spun out of X-Chem, Inc. in order to discover and develop advanced drug discovery programs based on novel machine learning technologies, until its acquisition by Relay Therapeutics, Inc., a clinical-stage precision medicine company, in April 2021. Prior to the spin-out of ZebiAI, from 2013 to 2020, he was Senior Vice President, Corporate Development, at X-Chem, Inc., a drug discovery company, where he closed multiple transactions with multinational pharmaceutical companies for programs in oncology, hematology/oncology, inflammation, infectious disease and rare diseases. From 2012 to 2015, Mr. Koval served as an independent corporate and business development consultant, advising multiple private and public biotech companies on partnering and fundraising. Mr. Koval's prior pharmaceutical experience from 1992 to 2012 includes serving roles in business and corporate development, strategic planning, alliance management

and financial evaluation and analysis at Novartis Pharmaceuticals Corporation, a pharmaceutical company, Merck & Co., Inc., a pharmaceutical company, and Chiron Corporation, a pharmaceutical company, where he finalized negotiations and executed and managed multiple strategic corporate partnerships and alliances. Mr. Koval holds an M.Sc. in Engineering from Rensselaer Polytechnic Institute and an M.B.A. from the Sloan School of Management at the Massachusetts Institute of Technology.

Stephen N. Rosenfield, J.D., has served as our Executive Vice President, Chief Legal Officer and Corporate Secretary since January 2019. Previously, he served as our Executive Vice President, General Counsel and Corporate Secretary from February 2012 to January 2019, General Counsel and Secretary since January 2012 and Secretary since October 2011. Mr. Rosenfield received a B.S. from Hofstra University and a J.D. from Northeastern University School of Law.

Employees

As of December 31, 2022, we had 107 full-time employees. Seventeen of our employees hold Ph.D. degrees and 41 hold other advanced degrees. Of this current total workforce, 58 employees were engaged in, or directly supported, our research and development activities, and 49 employees were engaged in commercial, medical affairs, business development, legal, finance, human resources, information technology and administration. None of our employees are covered by a collective bargaining agreement; nor have we experienced work stoppages. We consider relations with our employees to be good.

Consultants

We have established, and expect to continue to establish, consulting agreements with drug development professionals, clinicians, attorneys and regulatory experts with experience in numerous fields, including clinical science, biostatistics, clinical operations, pharmacovigilance, quality, manufacturing and regulatory affairs. We currently have approximately 90 active consulting agreements.

Corporate Information

Geron Corporation was incorporated in the State of Delaware on November 28, 1990. Geron UK Limited was incorporated in the United Kingdom on September 29, 2021. Geron Netherlands B.V. was incorporated in the Netherlands on February 17, 2023.

ITEM 1A. RISK FACTORS

We operate in a dynamic and rapidly changing environment involving numerous risks and uncertainties that may have a material adverse effect on our business, financial condition or results of operations. You should carefully consider the risks and uncertainties described below, together with all of the other information included in this annual report on Form 10-K. Our business faces significant risks and uncertainties, and those described below may not be the only risks and uncertainties we face. Additional risks and uncertainties not presently known to us or that we currently believe are immaterial may also significantly impair our business, financial condition or results of operations. If any of these risks or uncertainties occur, our business, financial condition or results of operations could suffer, the market price of our common stock could decline and you could lose all or part of your investment in our common stock.

RISKS RELATED TO THE DEVELOPMENT OF IMETELSTAT

Our future success depends solely on imetelstat, our only product candidate, and we cannot be certain that we will be able to continue to develop imetelstat or advance imetelstat to subsequent clinical trials, or that we will be able to receive regulatory approval for or to commercialize imetelstat, on a timely basis or at all.

Imetelstat is our sole product candidate, upon whose success we are wholly dependent. We do not currently have any other products or product candidates. Our ability to develop imetelstat and launch it commercially is subject to significant risks and uncertainties, including, obtaining regulatory approval from the FDA and EMA for commercializing imetelstat in lower risk MDS, as well as, among other things, our ability to:

- submit an NDA, to the FDA in the U.S., and a MAA to the EMA in the EU, in lower risk MDS that is accepted and/or validated for filing by the respective regulatory agency;
- obtain from the FDA and EMA their respective determinations that the regulatory submissions are sufficient to support regulatory approval to commercialize imetelstat in lower risk MDS, without the

requirement for additional pre-approval clinical trials or further testing or development commitments, if at all, any of which could result in increased costs to us, delay or limit our ability to generate revenue;

- obtain sufficient safety and efficacy data from IMpactMF to support any application for regulatory approval in relapsed/refractory MF, without clinically meaningful safety issues, side effects or dose-limiting toxicities related to imetelstat that may negatively impact its benefit-risk profile, whether or not in the same indications or therapeutic areas;
- ascertain that the use of imetelstat does not result in significant systemic or organ toxicities, including hepatotoxicity, or other safety issues resulting in an unacceptable benefit-risk profile;
- obtain additional capital in order to enable us to further advance the imetelstat program, including through the completion of IMpactMF, IMproveMF and IMpress, as well as to conduct the regulatory and potential commercialization activities necessary to potentially bring imetelstat to market in relapsed/refractory MF and any other future indications;
- develop clinical plans for, and successfully commence, conduct and complete potential future clinical trials of imetelstat;
- generate sufficient safety and efficacy data from ongoing and potential future clinical trials of imetelstat that provide a positive benefit-risk profile to support the continued and future development of imetelstat;
- obtain and maintain required regulatory clearances and approvals to enable continued clinical development, as well as potential commercialization, of imetelstat;
- enter into and maintain arrangements with third parties to provide services needed to further research and develop imetelstat, including maintaining the agreements with our contract research organizations, or CROs, or to manufacture imetelstat, in each case at commercially reasonable costs;
- recruit and retain sufficient qualified and experienced personnel to support the development and potential commercialization of imetelstat in the U.S., including to enroll, conduct and complete current and potential future clinical trials of imetelstat, and to provide internal capabilities for sales, marketing, distribution and other functions to support the potential commercialization of imetelstat in the U.S.;
- enter into and maintain arrangements with third parties to provide services needed to support the potential commercialization of imetelstat for territories outside of the U.S. in compliance with applicable laws;
- achieve acceptance of imetelstat, if approved, by patients and the relevant medical communities;
- compete effectively with other approved treatments in lower risk MDS;
- obtain appropriate coverage and reimbursement levels for the cost of imetelstat from governmental authorities, private health insurers and other third-party payors; and
- obtain, maintain and enforce adequate intellectual property and regulatory exclusivity for imetelstat both in the U.S. and globally.

If we are not able to successfully achieve the above-stated goals and overcome other challenges that we may encounter in the research, development, manufacturing and potential commercialization of imetelstat, we may be forced to abandon our development and/or commercialization of imetelstat, which would severely harm our business, prospects and our ability to raise additional capital, and might cause us to cease operations.

Our current and potential future clinical trials of imetelstat could be interrupted, delayed, terminated or abandoned for a variety of reasons, including due to the effects of macroeconomic conditions such as the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates or prospects of a recession, which could severely and adversely affect our financial results, business and business prospects, and the future of imetelstat.

Currently, the active clinical trials of imetelstat are IMpactMF and IMproveMF, and the investigator-led clinical trial, IMpress, and we are also retaining remaining patients in the treatment or follow-up phase of IMerge Phase 3. The conduct and completion of IMpactMF, IMproveMF and IMpress could be interrupted, delayed or abandoned for a variety of reasons, including due to the effects of macroeconomic conditions such as the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates or prospects of a recession. In particular, the fluidity and dynamic nature of the COVID-19 pandemic precludes any firm estimates as to the ultimate effect COVID-19 will have on our current and potential future clinical trials, our operations and our business, all of which depend on the continued

worldwide progress toward managing this health crisis. Although vaccine distribution, including booster shots, is being conducted in many countries, the emergence of COVID-19 variants and subvariants, and the resurgence of COVID-19 cases in many parts of the world cause further uncertainty and unpredictability on clinical trial activities, including clinical site initiations, patient screening and enrollment, as well as constraints on available sites and site personnel. For instance, the pace of enrollment for IMerge Phase 3 was slower than planned due to the COVID-19 pandemic, and we have experienced a similar effect on our other clinical trials, and we may face difficulties in retaining patients in the treatment or follow-up phases of our clinical trials. Site personnel resources for IMpactMF and IMproveMF remain constrained in the countries where we plan to conduct the trials, due to the negative impact of COVID-19, as well as a number of competing trials in MF and other oncology indications. Based on assumptions for enrollment and event (death) rates in the trial, we expect the interim analysis for OS for IMpactMF may occur in 2024 and the final analysis may occur in 2025. Because these analyses are event-driven and it is uncertain whether actual rates for enrollment and events will reflect current planning assumptions, the results may be available at different times than currently expected. Such macroeconomic conditions have and may continue to cause delays and suspensions in clinical trial activities at clinical sites. In addition, we may also experience clinical trial failures or delays related to:

- overcoming patient recruitment and enrollment challenges and operational delays related to opening new clinical sites, and conducting and completing IMpactMF, IMproveMF and IMpress due to the effects of the COVID-19 pandemic, while also competing with clinical trials for other investigational drugs in the same patient population;
- clinical sites electing to terminate their participation in any of our clinical trials, which would likely have a detrimental effect on patient enrollment;
- any inability to successfully retain patients in IMpactMF, including completing the planned interim analysis for IMpactMF;
- difficulties in patient recruitment and enrollment in IMproveMF;
- patient recruitment, enrollment, or retention, clinical site initiation, or retention problems associated with civil or political unrest or military conflicts around the world, including specifically the current military conflict between Ukraine and Russia;
- a higher number of patients being required for clinical trials, or higher than expected patient drop out rates;
- obtaining and/or maintaining regulatory clearances in the U.S. or other countries to conduct clinical trials, such as obtaining or maintaining regulatory clearances to commence, conduct or modify current or potential future clinical trials of imetelstat, in a timely manner, or at all, which could, for example, prevent us from, or result in substantial delays in, conducting or completing IMpactMF, IMproveMF and IMpress, or commencing potential future clinical trials of imetelstat;
- maintaining the investigational new drug applications, or INDs, and equivalent submissions in other countries for imetelstat without such INDs and/or equivalent submissions in other countries being placed on full or partial clinical hold, suspended or subject to other requirements by the FDA or other similar international regulatory authorities;
- contracting with a sufficient number of clinical trial sites to conduct current and potential future clinical trials, and ensuring that such contracts contain all necessary terms and conditions required by applicable laws, including providing for valid mechanisms to engage in cross-border data transfers, as well as identifying, recruiting and training suitable clinical investigators, especially given the constraints caused by the COVID-19 pandemic, and other competing clinical trials in MF and other oncology indications;
- obtaining or accessing necessary clinical data in accordance with appropriate clinical or quality practices and regulatory requirements, in a timely and accurate manner to ensure complete data sets;
- responding to safety findings, recommendations or conclusions by the internal data safety review committees, independent data monitoring committees and/or hepatic expert committees of current and potential future clinical trials of imetelstat based on emerging data occurring during such clinical trials, such as significant systemic or organ toxicities, including severe cytopenias, hepatotoxicity, fatal bleeding with or without any associated thrombocytopenia, or reduced platelet count, patient injury or death, or other safety issues, resulting in an unacceptable benefit-risk profile;
- use of trial endpoints that inherently require prolonged periods of clinical observation or analysis of the resulting data to determine trial outcomes;

- manufacturing sufficient quantities that meet our specifications and timelines of imetelstat, or other clinical trial materials, in a manner that meets the quality standards of the FDA and other similar international regulatory authorities, and responding to any disruptions to drug supply, clinical trial materials or quality issues that may arise, including as a result of (a) limitations in available manufacturing capacity due to obligations to manufacture and distribute vaccines to address the COVID-19 pandemic; (b) temporary or permanent shut down of contract manufacturing facilities due to violations of good manufacturing practices, or GMP, regulations or other applicable requirements; (c) infections or cross-contaminations of product candidates in the manufacturing process; (d) or capacity limitations;
- ensuring the ability to manufacture and supply imetelstat at acceptable costs for potential future clinical trials of imetelstat and potential commercial uses;
- obtaining sufficient quantities of any study-related treatments, materials (including best available therapy, or BAT, comparator products, placebo or combination therapies) or ancillary supplies, including in light of challenges and delays that may arise from the effects of macroeconomic conditions like the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates or prospects of a recession;
- obtaining acceptance by regulatory authorities of any manufacturing changes for imetelstat, as well as successfully implementing any such manufacturing changes;
- complying with current and future regulatory requirements, policies or guidelines, including domestic and international laws and regulations pertaining to fraud and abuse, transparency, and the privacy and security of health information;
- reaching agreement on acceptable terms and on a timely basis, if at all, with collaborators, physician investigators, vendors and other third parties located in the U.S. or jurisdictions in other countries, including our CROs, laboratory service providers and clinical trial sites, on all aspects of clinical development and collaborating with them successfully, including with respect to challenges and delays that have arisen and may continue to arise from the effects of the COVID-19 pandemic;
- third-party clinical investigators or our CROs losing the licenses or permits necessary to perform our clinical trials, not performing our clinical trials according to our anticipated schedule or consistent with the clinical trial protocol, good clinical practices, or GCP, or regulatory requirements, or not performing data collection or analyses in a timely or accurate manner;
- third-party contractors becoming debarred, disqualified or suspended or otherwise penalized by the FDA or other similar international regulatory authorities for violations of applicable regulatory requirements, in which case we may need to find a substitute contractor, and we may not be able to use some or all of the data produced by such contractors in support of any applications for regulatory approval;
- obtaining timely review and clearances by regulatory authorities for any clinical protocol amendments, modifications to our manufacturing process which may be sought for current and potential future clinical trials of imetelstat, including responding to questions or comments from these authorities in a timely and adequate manner, which could, for example, prevent us from conducting or completing IMpactMF, IMproveMF or IMpress, or commencing potential future clinical trials of imetelstat; and
- obtaining institutional review board or ethics committee approvals for clinical trial protocols or protocol amendments, including any future refinements to the trial designs we may seek for IMpactMF, IMproveMF or IMpress, or as a result of changes in regulatory requirements and policies, which could, for example, prevent us from conducting or completing IMpactMF, IMproveMF or IMpress, and commencing potential future clinical trials of imetelstat.

We could also encounter delays if a clinical trial is suspended or terminated. Clinical trials may be suspended or terminated due to a number of factors, including:

- failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols;
- inspection of the clinical trial operations or trial site by the FDA or similar international regulatory authorities resulting in the imposition of a clinical hold;
- safety issues or adverse side effects;
- failure to demonstrate a benefit from using a drug; or
- changes in governmental regulations or administrative actions.

Failures or delays with respect to any of the aforementioned events could adversely affect our ability to conduct or complete IMpactMF, IMproveMF or IMpress, or to commence, conduct and complete potential future clinical trials of imetelstat, which could increase development costs, or interrupt, further delay or halt our development or potential commercialization of imetelstat, any of which could severely and adversely affect our financial results, business and business prospects, and the future of imetelstat.

Further difficulties retaining patients in IMerge Phase 3 and enrolling or retaining patients in IMpactMF, IMproveMF and the investigator-led clinical trial IMpress, whether as a result of the effects of macroeconomic conditions like the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates or prospects of a recession, or for any other reasons, could further delay or otherwise adversely affect our clinical development and commercialization activities, which would cause our business and business prospects to be severely harmed.

The timely completion of a clinical trial in accordance with its protocol depends, among other things, on the ability to enroll a sufficient number of patients who remain in the trial until its conclusion. Further challenges in retaining patients in IMerge Phase 3 and screening, enrolling and retaining patients in IMpactMF, IMproveMF and IMpress, whether as a result of the effects macroeconomic conditions like the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates or prospects of a recession, or for any other reasons, may further delay our conduct of such trials, or cause them to be discontinued. For example, we have clinical trial sites in Ukraine, Russia and nearby European countries, and have experienced, and may continue to experience, delays and suspensions in clinical trial activities at clinical sites in Ukraine and Russia due to the current civil or political unrest conditions, including delays in clinical site initiations, patient screening and enrollment, as well as constraints on available sites and site personnel.

Although we reported positive top-line results from IMerge Phase 3 in January 2023, retaining remaining patients in the treatment or follow-up phase would allow us to continue to assess the longer-term durability of RBC-TI responses. Therefore, if we experience difficulties in retaining such patients, whether due to the effects of macroeconomic conditions like the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates or prospects of a recession, or for any other reasons, our ability to assess the longer-term durability of RBC-TI responses would be adversely affected. The retention of patients in IMerge Phase 3 and the enrollment and retention of patients in IMpactMF, IMproveMF and IMpress, depend on many factors, such as:

- our ability to identify and screen patients who meet the patient eligibility criteria specified in the protocol;
- the size of the patient population required for analysis of the trial's primary endpoint;
- the proximity of patients to trial sites, and patients' willingness and ability to travel to trial sites for treatment or monitoring during the COVID-19 pandemic or civil or political unrest, such as the military conflict between Ukraine and Russia;
- the design of the trial;
- our ability to recruit and retain clinical trial investigators with the appropriate competencies and experience;
- clinicians' and patients' perceptions of the potential advantages of imetelstat, both in relation to other available therapies, including new drugs that have been approved or may be approved for the indications being investigated, and as a result of data reported from previous or current clinical trials of imetelstat, and their willingness to participate in clinical trials of imetelstat;
- monitoring patients adequately during and after treatment;
- the ability to obtain and maintain patient consents;
- the risk that disease progression will result in death or clinical deterioration before the patient can enroll in a clinical trial of imetelstat, or before sufficient data has been collected from such patient, such that any data collected from the patient does not contribute in a meaningful way to the interpretation of the results of the clinical trial in which the patient is enrolled; and
- the risk that patients enrolled in any imetelstat clinical trial will drop out of the trial before completion, due to lack of efficacy, adverse side effects, investigator decision, progressive disease, site restrictions due to the effects of macroeconomic conditions like the COVID-19 pandemic, or civil or political unrest

or military conflicts around the world, such as the military conflict between Ukraine and Russia, alternate treatments being approved for the indication, or personal issues.

In addition, IMpactMF has competed and will continue to compete with, and earlier stage clinical trials of imetelstat, such as IMproveMF and IMpress, will compete with, other clinical trials for product candidates that are in the same therapeutic areas with imetelstat, and such trials may also be conducted at the same clinical sites. This competition is reducing the number of clinical sites and hospital staff available to participate in IMpactMF, IMproveMF and IMpress, as well as the number and type of patients available to enroll or remain in current and potential future imetelstat clinical trials. Moreover, because imetelstat represents a departure from more commonly used methods for cancer treatment, potential patients and their doctors may be inclined to use conventional therapies, rather than enroll patients into imetelstat clinical trials, or may decide not to enroll, or may not recommend enrollment, in IMpactMF, IMproveMF or IMpress, based on efficacy and safety results reported to date and that may be reported in the future.

Furthermore, if imetelstat is approved for commercialization, we will need to complete substantial preparations to be ready for any potential future commercialization of imetelstat. The development of an in-house marketing and sales force or entering into an arrangement with a third party for the commercialization of imetelstat outside of the U.S. will require significant capital expenditures, management resources and time, and may have an adverse effect on the timely completion of IMpactMF, IMproveMF and IMpress.

Delays caused by the effects of macroeconomic effects, like the COVID-19 pandemic or civil or political unrest or military conflicts around the world, such as the current military conflict between Ukraine and Russia, or other factors in patient enrollment, or the inability to retain or treat patients, have resulted in and may in the future result in further increased costs due to extended timelines and other factors, and may lead to incomplete data sets, or adversely affect the timing or outcome of current and potential future clinical trials of imetelstat which could delay or prevent the commencement, conduct or completion of these trials and adversely affect the clinical development, as well as the timing or outcome of the potential commercialization of imetelstat. Such occurrences would severely and adversely affect our financial results, business and business prospects, and the future of imetelstat.

Imetelstat may continue to cause, or have attributed to it, undesirable or unintended side effects or other adverse events that could further delay or prevent the commencement and/or completion of clinical trials for imetelstat, further delay or prevent its regulatory approval, or limit its commercial potential.

Imetelstat may continue to cause, or have attributed to it, undesirable or unintended side effects or other adverse events affecting its safety or efficacy that could interrupt, further delay or halt current or potential future clinical trials of imetelstat, such as IMerge Phase 3, IMpactMF, IMproveMF and IMpress. In this regard, adverse events and dose-limiting toxicities observed in previous and ongoing clinical trials of imetelstat include:

- hematologic toxicities, such as profound and/or prolonged thrombocytopenia or neutropenia, including one case of febrile neutropenia after prolonged myelosuppression with intracranial hemorrhage resulting in patient death, which the investigator assessed as possibly related to imetelstat, as well as reversible Grade 4 febrile neutropenia;
- bleeding events, with or without thrombocytopenia, including reversible Grade 3/4 bleeding events;
- hepatotoxicity and liver function test abnormalities, as well as hepatic failure;
- gastrointestinal events;
- infections;
- muscular and joint pain;
- fatigue;
- headache; and
- infusion-related reactions.

If patients in any clinical trials of imetelstat, including IMerge Phase 3, IMpactMF, IMproveMF, IMpress or any potential future clinical trials of imetelstat, experience similar or more severe adverse events, or new or unusual adverse events, or if the FDA or other similar international regulatory authorities determine that efficacy and safety data in current or potential future clinical trials of imetelstat do not support an adequate benefit-risk profile to justify continued treatment of patients, then the FDA or other similar international regulatory authorities may again place one or more of the INDs for imetelstat on clinical hold, as occurred in March 2014. If this were to occur, there

would be a significant delay in, or possible termination of, such clinical trial or all the imetelstat clinical trials and any potential commercialization efforts, which might cause us to cease operations. For example, we recently became aware of a case in our IMpactMF clinical trial of a patient with myelofibrosis associated with underlying progressive bone marrow failure, who died from febrile neutropenia, pulmonary hemorrhage and bilateral pneumonia, which, at the time of reporting, the investigator related to imetelstat. If such toxicities or other safety issues in any clinical trial of imetelstat are determined by us, the FDA or similar international regulatory authorities to result in an unacceptable benefit-risk profile, then:

- additional information supporting the benefit-risk profile of imetelstat may be requested by the FDA or similar international regulatory authorities and if any such information supplied by us, or by our former collaboration partner, is not deemed acceptable, current clinical trials of imetelstat could be suspended, terminated, or placed on clinical hold by the FDA or similar international regulatory authorities;
- the ability to retain enrolled patients in current clinical trials may be negatively affected, resulting in incomplete data sets and the inability to adequately assess the benefit-risk profile of imetelstat in a specific patient population; or
- additional, unexpected clinical trials or non-clinical studies may be required to be conducted.

Further, clinical trials by their nature examine the effect of a potential therapy in a sample of the potential future patient population. As such, clinical trials conducted with imetelstat, to date and in the future, may not uncover all possible adverse events that patients treated with imetelstat may experience. Because remaining patients in IMerge Phase 3, IMpactMF and IMproveMF continue to receive imetelstat treatment, additional or more severe toxicities or safety issues, including additional non-serious or serious adverse events and dose-limiting toxicities, may be observed as patient treatment continues and more data become available. In addition, because additional data are being generated from these trials, the benefit-risk profile of imetelstat will continue to be assessed, including the risk of hepatotoxicity, severe cytopenias, fatal bleeding with or without any associated thrombocytopenia, patient injury or death, and any other severe adverse effects that may be associated with life-threatening clinical outcomes.

The occurrence of any of the aforementioned events could interrupt, further delay, or halt, any development, and as a result, impact or preclude the potential commercialization of imetelstat, as well as increase costs to develop imetelstat, which would have a severe adverse effect on our results of operations, financial condition and ability to raise additional capital, business prospects and the future of imetelstat, any of which might cause us to cease operations.

The design of a clinical trial can determine whether its results will support regulatory approval of a product, and flaws in the trial design may not become apparent until the clinical trial is well advanced or during the approval process after the trial is completed.

A trial design that is considered appropriate for regulatory approval includes a sufficiently large sample size with appropriate statistical power, as well as proper control of bias, to allow a meaningful interpretation of the results. The preliminary results of imetelstat clinical trials with smaller sample sizes can be disproportionately influenced by the impact the treatment had on a few individuals, which limits the ability to generalize the results across a broader community, making the trial results of clinical trials with smaller sample sizes less reliable than trials with a larger number of patients. As a result, there may be less certainty that imetelstat will achieve a statistically significant effect in any future clinical trials.

For example, we shortened the follow-up period after the last patient has been enrolled from 15 months to 12 months to enable an earlier clinical cut-off date for the primary analysis in IMerge Phase 3. Although we reported positive top-line results from IMerge Phase 3 in January 2023, our decision to shorten the follow-up period after the last patient has been enrolled may result in further clinical responses that could occur after the 12-month clinical cut-off date being excluded from the primary analysis. The exclusion of this future data from the primary analysis could reduce the overall efficacy results of the trial, including durability of transfusion independence, which could limit or prevent marketing approval of imetelstat in lower risk MDS by the FDA or similar international regulatory authorities, cause them not to approve imetelstat at all or require additional clinical trials or further testing prior to granting any regulatory approval to market imetelstat in lower risk MDS.

Moreover, with respect to the trial design for IMpactMF, the FDA urged us to consider adding a third dosing arm to the trial to assess a lower dose and/or a more frequent dosing schedule that might improve the trial's chance of success by identifying a less toxic regimen and/or more effective spleen response, one of the trial's secondary endpoints. Based on data from IMbark, we believe that testing a lower dose regimen would likely result in a lower median OS, which is the trial's primary endpoint, in the imetelstat treatment arm. Existing data also suggest that lowering the dose would not result in a clinically meaningful reduction in toxicity, and for these reasons we

therefore determined not to add a third dosing arm to the trial design, and the FDA did not object to our proposed imetelstat dose and schedule of 9.4 mg/kg every three weeks. Our belief may ultimately be incorrect. Therefore, our failure to add a third dosing arm could result in a failure to maintain regulatory clearance from the FDA and similar international regulatory authorities, could result in the trial's failure, or could otherwise delay, limit or prevent marketing approval of imetelstat in relapsed/refractory MF by the FDA or similar international regulatory authorities.

Results and data we disclosed from prior non-clinical studies and clinical trials may not predict success in later clinical trials, and we cannot assure you that any ongoing or future clinical trials of imetelstat will lead to similar results and data that could potentially enable us to obtain any regulatory approvals.

Success in non-clinical testing and early clinical trials, including Phase 2 clinical trials, such as IMbark, does not ensure that later clinical trials will be successful, nor does it predict final clinical trial results. In addition, even though we reported positive top-line results from IMerge Phase 3 in January 2023, this does not ensure that any other clinical trials of imetelstat, including IMpactMF, IMproveMF and IMpress, will be successful. We cannot be certain that any of the prior, current or potential future clinical trials of imetelstat will generate sufficient, consistent or adequate efficacy and safety data demonstrating a positive benefit-risk profile, which would be necessary to obtain regulatory approval to market imetelstat in any indication. Imetelstat in later stages of clinical trials may fail to show the desired benefit-risk profile despite having progressed through non-clinical studies and initial clinical trials. Many companies in the biopharmaceutical industry have frequently suffered significant setbacks in later clinical trials, even after achieving promising results in earlier non-clinical studies or clinical trials.

In IMbark, we reported a median overall survival of 19.9 months and 28.1 months for the 4.7 mg/kg and 9.4 mg/kg dosing arms, respectively, in relapsed/refractory MF patients. In general, Phase 3 clinical trials with larger numbers of patients or longer durations of therapy may fail to replicate efficacy and safety results observed in earlier clinical trials, such as IMbark, and if this were to occur with IMpactMF, this would adversely affect future development prospects of imetelstat, and as a result, impact the potential commercialization of imetelstat, which would substantially impair our ability to raise additional capital.

Furthermore, non-clinical and clinical data are often susceptible to varying interpretations and analyses. In some instances, there can be significant variability between different clinical trials of imetelstat due to numerous factors, including changes in trial procedures set forth in trial protocols, differences in the size and type of patient populations, and changes in and adherence to the dosing regimens. For example, complete and partial remissions were observed in an investigator-sponsored pilot study of imetelstat conducted at Mayo Clinic in MF patients, or the Pilot Study. However, similar activity was not observed in the MF patients enrolled in IMbark, as shown by the one partial remission observed in the IMbark primary analysis. We believe that differences in the IMbark study design when compared to the Pilot Study design, such as more restrictive patient enrollment criteria requiring either documented objective lack of response to a JAK inhibitor or evidence of progressive disease while on treatment with a JAK inhibitor, may have contributed to the data observed in IMbark differing significantly from data reported from the Pilot Study, but we cannot assure you that any future clinical trials of imetelstat in relapsed/refractory MF will yield results comparable to IMbark or the Pilot Study. In addition, the potential improvement in survival observed in the 9.4 mg/kg dosing arm in IMbark will need to be further assessed in IMpactMF, and similar results, including potential improvement in survival, if any, with respect to any patient population or patient population subgroup, may not be observed in IMpactMF. Likewise, although the statistical analyses comparing IMbark data to closely matched real world data, or RWD, published in the September 2021 issue of the Annals of Hematology, suggest potentially favorable OS in relapsed/refractory MF patients treated with imetelstat, compared to BAT using closely matched patients' RWD, such comparative analyses between RWD and our clinical trial data have several limitations. For instance, the analyses create a balance between treatment groups with respect to commonly available covariates, but do not take into account the unmeasured and unknown covariates that may affect the outcomes of the analyses. Potential biases are introduced by factors which include, for example, the selection of the patients included in the analyses, misclassification in the matching process, the small sample size, and estimates that may not represent the outcomes for the true treated patient population. For these and other reasons, such comparative analyses and any conclusions from such analyses should be considered carefully and with caution, and should not be relied upon as demonstrative or otherwise predictive or indicative of any current or potential future clinical trial results of imetelstat in relapsed/refractory MF, including IMpactMF.

Failure to achieve results supporting a positive benefit-risk profile in current or potential future imetelstat clinical trials would interrupt, further delay, or halt, any development, and as a result, potential commercialization of imetelstat, which would have a severe adverse effect on our results of operations, financial condition and ability to raise additional capital, business prospects and the future of imetelstat.

Interim, "snapshot," "top-line," and preliminary data or statistical analyses from clinical trials that we announce or publish from time-to-time may change as more patient data become available, may be more positive than the final data, and are subject to audit and verification procedures that could result in material changes in the final data. Thus, such preliminary data should be considered carefully and with caution and not relied upon as indicative of future clinical results.

From time-to-time, preliminary or interim safety and efficacy data from previous and current imetelstat clinical trials have been reported or announced by us, clinical investigators or our former collaboration partner. Preliminary data is based on a preliminary analysis of then available data, and the results and related findings and conclusions are subject to change following a more comprehensive review of the data related to the particular study or trial. We also make assumptions, estimations, calculations and conclusions as part of our analyses of data, and we may not have received or had the opportunity to fully and carefully evaluate all data. As such, preliminary or interim results may not be reproduced in any current or potential future clinical trials of imetelstat, and thus should be considered carefully and with caution, and not relied upon as indicative of future clinical results. Additional or updated safety and efficacy data from current or potential future clinical trials of imetelstat may result in a benefit-risk profile that does not justify the continued development of imetelstat in a particular patient population, or at all. Any data reported from IMpactMF may materially differ from and be less positive than data previously reported from IMbark. Thus, reported data should be considered carefully and with caution, and not relied upon as indicative of future clinical results. Such additional data could result in a lower benefit-risk profile than initially expected, which could hinder the potential success of IMpactMF, IMproveMF or IMpress, or cause us to abandon further development of imetelstat entirely.

In January 2023, we announced positive top-line results from IMerge Phase 3. Such top-line results may differ from future results of the same study, or different conclusions or considerations may qualify such results, once additional data have been received and fully evaluated. Top-line data also remain subject to audit and verification procedures that may result in the final data being materially different from the preliminary data we previously published. As a result, top-line data, including from IMerge Phase 3, should be viewed with caution until the final data are available. Material adverse differences in final data, compared to preliminary or interim data, could severely and adversely affect our financial results, business and business prospects, and the future of imetelstat, including the potential commercialization of imetelstat, and might cause us to cease operations.

The research and development of imetelstat is subject to numerous risks and uncertainties.

The science and technology of telomere biology, telomerase and our proprietary oligonucleotide chemistry are relatively new. There is no precedent for the successful commercialization of a therapeutic product candidate based on these technologies. Significant research and development activities will be necessary to further develop imetelstat, our sole product candidate, and may take years to accomplish, if at all.

Because of the significant scientific, regulatory and commercial challenges that must be overcome to successfully research, develop and commercialize imetelstat, the development of imetelstat in myeloid hematologic malignancies, including MDS and MF, may be further delayed or abandoned, even after significant resources have been expended on it. Examples of such situations include:

- in September 2012, the discontinuation of our Phase 2 clinical trial of imetelstat in metastatic breast cancer;
- in April 2013, the discontinuation of our development of imetelstat in solid tumors with short telomeres;
- in March 2014, the full clinical hold placed by the FDA on imetelstat clinical trials;
- in the third quarter of 2016, closure of the 4.7 mg/kg dosing arm in IMbark to new patient enrollment and suspension of enrollment in the 9.4 mg/kg dosing arm in IMbark because an insufficient number of patients in the 9.4 mg/kg dosing arm met the protocol defined interim efficacy criteria at 12 weeks;
- in the third quarter of 2017, expansion of IMerge Phase 2 to enroll additional lower risk MDS patients in a target patient population; and
- in September 2018, our former collaboration partner's decision to terminate its imetelstat collaboration agreement with us.

Further delay, suspension or abandonment of our development of imetelstat in myeloid hematologic malignancies, including with respect to our IMpactMF, IMproveMF and IMpress clinical trials, could have a material adverse effect on the future of imetelstat and our business prospects, including the potential commercialization of imetelstat in indications other than lower risk MDS.

We rely on third parties to conduct our current and potential future clinical trials of imetelstat. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, we may be unable to continue the development of, obtain regulatory approval for, or commercialize imetelstat.

We do not have the ability to independently conduct clinical trials. Therefore, we rely on medical institutions, clinical investigators, contract laboratories and other third parties, such as CROs, service providers, vendors, suppliers and consultants, to conduct clinical trials of imetelstat. The third parties we contract with for execution of our current and potential future clinical trials of imetelstat play a critical role in the conduct of these trials and the subsequent collection and analysis of data. However, these third parties are not our employees, and except for contractual duties and obligations, we have limited ability to control their performance, or the amount or timing of resources that they devote to imetelstat. For example, we have retained CROs to support our imetelstat clinical development activities, and any failure by our CROs to perform their contractual obligations, whether due to the effects of the COVID-19 pandemic or otherwise, or disputes with our CROs about the quality of their performance or other matters, could further delay or halt our imetelstat clinical development activities including current or future imetelstat clinical trials. These third parties may also have relationships with other commercial entities, some of which may compete with us. Under certain circumstances, these third parties may terminate their agreements with us without cause and upon immediate written notice.

Although we rely on third parties to conduct our imetelstat clinical trials, including IMerge Phase 3, IMpactMF and IMproveMF, we remain responsible for ensuring that each clinical trial is conducted in accordance with its investigational plan and protocol, and applicable laws. Moreover, the FDA and similar international regulatory authorities require us to comply with GCP regulations and standards for conducting, monitoring, recording and reporting the results of clinical trials to ensure that the data and results are scientifically credible and accurate, and that the rights, integrity and confidentiality of patients participating in clinical trials are protected, including being adequately informed of the potential risks. Regulatory authorities enforce these GCP requirements through periodic inspections of trial sponsors, principal investigators and trial sites. If we or any of our CROs fail to comply with applicable GCP requirements, the clinical data generated in our clinical trials may be deemed unreliable and the FDA, or similar international regulatory authorities, may require us to perform additional clinical trials before approving any application for approval. We cannot assure you that upon inspection by a given regulatory authority, such regulatory authority will determine that any of our clinical trials comply with GCP or other applicable regulations. In addition, our clinical trials must be conducted with imetelstat produced under applicable GMP regulations. Our failure to comply with these regulations may require us to repeat clinical trials, which would further delay the process for any regulatory approval. Our ability to comply with these regulations and standards may be contingent upon activities conducted by third parties, and if they fail to perform in accordance with contractual obligations and legal requirements, our development of imetelstat may be interrupted, further delayed or halted. Any failures by us or third parties noted above would have a severe adverse effect on our results of operations, financial condition and ability to raise additional capital, business prospects and the future of imetelstat, including the potential commercialization of imetelstat, any of which might cause us to cease operations.

We also are required to register imetelstat clinical trials that we sponsor and post the results of certain completed clinical trials on certain government-sponsored databases, such as ClinicalTrials.gov, within certain timeframes. Failure to do so can result in fines, adverse publicity and civil and criminal sanctions.

Furthermore, the execution of clinical trials and the subsequent compilation and analysis of the data produced, including the interim and final analyses for IMpactMF, requires coordination among various parties. In order for these functions to be carried out effectively and efficiently, it is imperative that these parties communicate and coordinate with one another. If the quality or accuracy of the clinical data obtained, compiled or analyzed by third parties is compromised due to their failure to adhere to our clinical trial protocols, GCP or GMP requirements, or for any other reason, we may need to enter into new arrangements with alternative third parties, which would cause delay, and could be difficult, costly or impossible. If third parties conducting our clinical trials do not perform their contractual duties or obligations, experience work stoppages, do not meet expected deadlines, terminate their agreements with us or need to be replaced, our clinical trials may be extended, delayed or terminated, or may be unsuccessful or need to be repeated, which could have a material adverse effect on our business, including the potential commercialization of imetelstat, and might cause us to cease operations.

If any of our relationships with these third parties terminate, we may not be able to enter into arrangements with alternative third parties or do so on commercially reasonable terms. Switching or adding CROs, investigators and other third parties involves additional costs and delays because of the time it takes to finalize a contract with a new CRO and for their commencement of work. As a result, delays can occur, which could materially impact our ability to meet our desired clinical development timelines. The COVID-19 pandemic and public health safety measures taken in response have also had a significant impact on our CROs and other third parties. Although we

carefully manage our relationships with our CROs, investigators and other third parties, we and any of these third parties may nonetheless encounter challenges or delays in the future, which could have a material and adverse impact on our business, business prospects and the future of imetelstat.

In addition, certain principal investigators for our clinical trials serve as scientific advisors or consultants to us from time to time and receive compensation in connection with such services. Under certain circumstances, we may be required to report some of these relationships to the FDA. The FDA may conclude that a financial relationship between us and a principal investigator has created a conflict of interest or otherwise affected conduct of the trial. The FDA may therefore question the integrity of the data generated at the applicable clinical trial site and the utility of the clinical trial itself may be jeopardized. This could result in a delay in approval, or rejection, of any applications for approval by the FDA and may ultimately lead to the denial of approval of imetelstat.

We will not control the conduct of current or any potential future investigator-led clinical trials, and data from such trials could show marginal efficacy and/or clinically relevant safety concerns related to imetelstat resulting in an unfavorable benefit-to-risk assessment that could impact our ongoing clinical trials or development program for imetelstat.

We will not control the design or administration of the investigator-led clinical trial, IMpress, or any potential future investigator-led trials, nor the submission, approval or maintenance of any IND or foreign equivalent required to conduct these clinical trials. In addition, we will not have control over the timing and reporting of the data from any such investigator-led clinical trials. A delay in the timely completion of or reporting of data from any potential future investigator-led clinical trial could have a material adverse effect on our ability to further develop imetelstat or to advance imetelstat to subsequent clinical trials.

Investigator-led clinical trials may be conducted under less rigorous clinical standards than those used in company-sponsored clinical trials. Accordingly, regulatory authorities may closely scrutinize the data collected from these investigator-led clinical trials. In addition, any potential future investigator-led clinical trials could show marginal efficacy and/or clinically relevant safety concerns that could delay the further clinical development or marketing approval of imetelstat for any indication. To the extent that the results of any potential future investigator-led clinical trials raise safety or other concerns regarding imetelstat, regulatory authorities may question the results of such investigator-led clinical trials, or question the results of IMerge Phase 3, IMpactMF, and IMproveMF. Safety concerns arising from any potential future investigator-led clinical trials could result in partial or full clinical holds being placed on the imetelstat INDs by the FDA or other similar international regulatory authorities, as occurred in March 2014, which would further delay or prevent us from advancing imetelstat into further clinical development and cause us to discontinue our development of imetelstat, which would severely harm our business and prospects, including the potential commercialization of imetelstat, and could potentially cause us to cease operations.

RISKS RELATED TO REGULATORY APPROVAL AND COMMERCIALIZATION OF IMETELSTAT

Our inability to obtain and maintain regulatory clearances and approvals to continue the clinical development of, and to potentially commercialize, imetelstat, would severely and adversely affect imetelstat's future value, and our business and business prospects, and might cause us to cease operations.

Federal, state and local governments in the U.S. and governments in other countries have significant regulations in place that govern drug research and development and may prevent us from successfully conducting development efforts or potentially commercializing imetelstat. Delays in obtaining or failure to maintain regulatory clearances and approvals, or limitations in the scope of such clearances or approvals, could:

- impede or halt our activities and plans for clinical development and commercialization;
- significantly harm the commercial potential of imetelstat;
- impose additional development costs;
- diminish any competitive advantages that may have been available to us; or
- further delay or preclude any revenue we may receive from the future commercialization of imetelstat, if any.

In addition, with respect to the trial design for IMpactMF, the FDA urged us to consider adding a third dosing arm to the trial to assess a lower dose and/or a more frequent dosing schedule that might improve the trial's chance of success by identifying a less toxic regimen and/or more effective spleen response, one of the trial's secondary endpoints. Based on data from IMbark, we believe that testing a lower dose regimen would likely result in a lower

median OS, which is the trial's primary endpoint, in the imetelstat treatment arm. Existing data also suggest that lowering the dose would not result in a clinically meaningful reduction in toxicity, and for these reasons we therefore determined not to add a third dosing arm to the trial design and the FDA did not object to our proposed imetelstat dose and schedule of 9.4 mg/kg every three weeks. Our belief may ultimately be incorrect. Therefore, our failure to add a third dosing arm could result in a failure to maintain regulatory clearance from the FDA and similar international regulatory authorities, could result in the trial's failure, or could otherwise delay, limit or prevent marketing approval of imetelstat for relapsed/refractory MF by the FDA or similar international regulatory authorities.

Furthermore, in IMerge Phase 3 we shortened the follow-up period after the last patient has been enrolled from 15 months to 12 months to enable an earlier clinical cut-off date for the primary analysis. Although we reported positive top-line results from IMerge Phase 3 in January 2023, our decision to shorten the follow-up period after the last patient has been enrolled may result in further clinical responses that could occur after the 12-month clinical cut-off date being excluded from the primary analysis. The exclusion of this future data from the primary analysis could reduce the overall efficacy results, including durability of transfusion independence, which could otherwise delay, limit or prevent marketing approval of imetelstat in lower risk MDS by the FDA or similar international regulatory authorities or require additional clinical trials and further testing prior to granting any regulatory approval to market imetelstat in lower risk MDS.

Even though we reported positive top-line results from IMerge Phase 3 in January 2023, those results are not necessarily predictive of imetelstat activity in other indications and for other pivotal trials that may be needed to support any application to the FDA or similar international regulatory authorities for such other indications, such as from IMpactMF. We may therefore fail to further develop or commercialize imetelstat, which would severely and adversely affect our business and business prospects, and might cause us to cease operations.

If we are unable to prepare and timely submit the planned NDA for imetelstat in lower risk MDS, and to successfully obtain regulatory approval for and commercialize imetelstat, or experience significant delays in doing so, our business will be materially harmed.

The process of obtaining marketing approvals, both in the U.S. and in other countries, is lengthy, expensive and uncertain. It may take many years to obtain approval, if approval is obtained at all, and can vary substantially based upon a variety of factors, including the type, complexity and novelty of the product candidates involved. Of the large number of drugs in development, only a small percentage complete the regulatory approval process and are successfully commercialized. In addition, the lengthy review process as well as the unpredictability of future clinical trial results may result in a delay in obtaining, or our failure to obtain, regulatory approval for imetelstat in lower risk MDS, relapsed/refractory MF, or any other indication, which would significantly harm our business, business prospects, including the potential commercialization of imetelstat, and the future value of imetelstat and might cause us to cease operations.

Securing marketing approval requires the submission of extensive non-clinical and clinical data and supporting information to regulatory authorities for each therapeutic indication to establish the product candidate's safety and efficacy, as well as information about the product manufacturing process and any inspections of manufacturing facilities conducted by regulatory authorities through the filing of an NDA in the U.S. and an MAA in Europe. As a company, we have not previously submitted an NDA to the FDA or similar applications to comparable international regulatory authorities for imetelstat. The preparation of an NDA requires a great deal of effort and expertise, and if we do not secure the necessary resources and retain personnel having the requisite expertise to prepare and submit an NDA, the filing of any NDA would be delayed. Further, if we submit an NDA, there can be no assurance that it will be accepted by the FDA. If the FDA determines after an initial review of the NDA that the data included in the application is insufficient and not ready for formal consideration, we could receive a "refuse to file" notice. The FDA also has substantial discretion in the approval process.

While we reported positive top-line results from IMerge Phase 3 in lower risk MDS, and while we believe that these results and our assessment of the positive benefit-risk profile of imetelstat, combined with data from our Phase 2 clinical trials, are supportive of planned regulatory submissions in the U.S. and in the EU for imetelstat in lower risk MDS, regulatory authorities in those jurisdictions may disagree with our interpretation of the data and may require additional clinical testing before we can seek regulatory approval and begin commercialization of imetelstat, if at all, any of which could result in increased costs to us, delay or limit our ability to generate revenue and adversely affect our commercial prospects. There is no guarantee that we will obtain regulatory approval or be able to commence commercialization on the timeline we are planning or at all.

Imetelstat must receive all relevant regulatory approvals before it may be marketed in the U.S. or other countries. Regulatory authorities have substantial discretion in the approval process and can delay, limit or deny approval of imetelstat or require us to conduct additional non-clinical or clinical testing or abandon a program for many reasons, including:

- disagreement with the design or implementation of our clinical trials, including our statistical analysis of trial results;
- failure to demonstrate to the FDA or similar international regulatory authorities that imetelstat's efficacy results, including duration of response, is acceptable;
- unfavorable benefit-to-risk assessment, in the case of marginal efficacy and/or clinically relevant safety concerns, for any proposed indication;
- serious and unexpected drug-related side effects experienced by participants in our clinical trials or by individuals using drugs similar to imetelstat;
- disagreement with our interpretation of data from non-clinical studies or clinical trials, including disagreement from any advisory committee convened in connection with the NDA review;
- failure to collect data from clinical trials of imetelstat meeting the level of integrity or statistical or clinical significance required by the FDA or similar international regulatory authorities, or a determination such data is not sufficient to support the submission of an NDA, MAA, or other submission, or to obtain regulatory approval in the U.S., the EU or elsewhere;
- deficiencies in our clinical trial operations or the clinical trial operations of trial sites, including as a result of FDA or EMA bioresearch monitoring inspections in conjunction with NDA or MAA review;
- identification of critical issues as a result of a pre-approval health authority inspection that could negatively impact the integrity of data in an NDA or MAA and lead to a rejection by the FDA and similar international health authorities;
- errors or deficiencies in the conduct of the imetelstat program prior to its transition to us by our former collaborator, and/or in the transition of the imetelstat program to us by our former collaborator;
- unwillingness or inability by our former collaborator to provide information requested by the FDA or similar international regulatory authorities regarding the time period when our former collaborator was responsible for the imetelstat program;
- a determination by the FDA or similar international regulatory authorities that the appropriate indication for commercial use of imetelstat is narrower or more restrictive than anticipated;
- failure to satisfy the requirement to develop a risk evaluation and mitigation strategy, or REMS, for the U.S. and a risk management plan for the EU including post-marketing studies, as a potential condition to approval;
- disagreement regarding the formulation, labeling and/or the specifications for imetelstat;
- a determination by the FDA or similar international regulatory authorities that the manufacturing processes, test procedures and specifications applicable to the manufacture of imetelstat, or the facilities of the third-party manufacturers with which we contract for clinical and commercial supplies of imetelstat are inadequate, or failure by such third-party manufacturers to maintain compliance with the regulatory and other requirements established by the FDA or similar international regulatory authorities, including as a result of preapproval inspections conducted in conjunction with NDA or MAA review;
- the failure of the quality or stability of imetelstat to meet acceptable regulatory standards;
- the FDA or similar international regulatory authorities may lack resources or be delayed in conducting pre-approval inspections due to reasons related to COVID-19 or otherwise;
- we or any third-party service providers may be unable to demonstrate compliance with current good manufacturing practices, or cGMPs, and/or good clinical practices, or GCPs, to the satisfaction of the FDA or similar international regulatory authorities;

- changes in regulatory policies or approval processes, or potential reduction of unmet medical need with the entry of competitive therapies to the market, could render our clinical efficacy or safety data insufficient for approval; or
- political factors surrounding the approval process, such as government shutdowns, political instability or global pandemics, such as COVID-19.

Furthermore, in recent years, there has been increased public and political scrutiny on the FDA and similar international regulatory authorities with respect to the approval process for new drugs, and as a result regulatory authorities may apply more stringent regulatory standards, especially regarding drug safety, when reviewing regulatory submissions for new drugs.

Even if we believe we have complied with all of the regulatory requirements to receive marketing approval for imetelstat, we may not obtain marketing approval for reasons that we do not currently predict. If we fail to obtain regulatory approval for imetelstat, we will have no commercialized products and correspondingly no revenue.

Any marketing approval we ultimately obtain may be limited or subject to restrictions or post-approval commitments that render imetelstat not commercially viable, which would harm imetelstat's future value and our business and business prospects. In addition, obtaining regulatory approval is a lengthy, expensive and uncertain process. For example, following the result of a referendum in 2016, the U.K. left the EU on January 31, 2020, commonly referred to as Brexit, and its withdrawal from the EU was completed on December 31, 2020. The withdrawal of the U.K. from the EU has resulted in uncertainty in relation to the regulatory process in the U.K., and for Europe could potentially result in a delay in the review of regulatory submissions which could also lead to less efficient, more expensive, and potentially lengthier regulatory review processes for companies like us, who may seek to obtain regulatory approval for drug products in the EU or the U.K. Such regulatory changes in the U.K. or elsewhere could adversely affect and/or delay our ability to obtain approval of, and market and sell, imetelstat in the U.S. or other countries.

Regulatory authorities may also not approve the labeling claims that are necessary or desirable for the successful commercialization of a drug, such as imetelstat. For example, future regulatory clearances, if any, that we might obtain for imetelstat may be limited to fewer or narrower indications than we might request, or may be granted subject to the performance of post-marketing studies, which may impose further requirements or restrictions on the distribution or use of imetelstat, such as limiting prescribing to certain physicians or medical centers that have undergone specialized training, limiting treatment to patients who meet certain safe-use criteria, and requiring treated patients to enroll in a registry. These limitations and restrictions may limit the size of the market for imetelstat and affect reimbursement by third-party payors. Future regulatory clearances, if any, may be limited to a smaller patient population, or may require a different drug formulation or a different manufacturing process, than we might in the future decide to seek.

In addition, failure by our former collaborator to comply with applicable regulatory guidelines prior to our assumption of sponsorship of the imetelstat program could result in administrative or judicially imposed sanctions on us, including warning letters, civil and criminal penalties, injunctions, product seizures or detention, product recalls, total or partial suspension of manufacturing activities, and the potential refusal to approve any NDAs.

Any delay in obtaining or failure to obtain required approvals of imetelstat, or limitations on any regulatory approval that we might receive in the future, if any, could reduce the potential commercial use of imetelstat, and potential market demand for imetelstat and therefore result in decreased revenue for us from any commercialization of imetelstat, any of which would severely and adversely affect our financial results and ability to raise additional capital, the price of our common stock, our business and business prospects, including the potential commercialization of imetelstat, and the future of imetelstat, and might cause us to cease operations.

If imetelstat is approved for commercialization and we are unable to establish sales, marketing and distribution capabilities or enter into agreements with third parties to commercialize imetelstat, we will be unable to successfully commercialize imetelstat if and when it is approved.

We will need to complete substantial preparations to be ready for any potential future commercialization of imetelstat, and currently we have no sales, marketing or distribution capabilities and no experience in marketing products. To advance imetelstat to potential marketing approval, we will be required to complete our commercialization preparatory activities, and continue to incur related expenses, before we obtain any marketing approval. These activities will include, among other things, the development of an in-house marketing and sales force, which will require significant capital expenditures, management resources and time. We will have to compete with other companies to recruit, hire, train and retain qualified marketing and sales personnel. If we are unable to

adequately prepare for the potential future commercialization of imetelstat, we may not be able to generate product revenue if marketing authorization is obtained.

There are risks involved with both establishing our own sales, marketing and distribution capabilities and entering into arrangements with third parties to perform these services. For example, recruiting and training a sales force is expensive and time consuming and could delay any product launch. If the commercial launch of imetelstat for which we recruit a sales and marketing force and establish distribution capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses, which would be costly. Even if imetelstat is approved in lower risk MDS and we are able to establish our own sales and marketing capabilities, imetelstat will be a newly-marketed drug. As a result, we will be required to expend significant time and resources to train sales personnel in commercializing imetelstat. If we are unable to effectively train sales personnel and equip them with compliant and effective materials, our efforts to successfully commercialize imetelstat could be adversely affected, which would negatively impact our business, business prospects and the future value of imetelstat.

Factors that may inhibit our efforts to commercialize imetelstat on our own include:

- our inability to recruit, train and retain adequate numbers of effective sales, marketing, distribution, coverage or reimbursement, customer service, medical affairs and other support personnel;
- our inability to equip sales personnel with compliant and effective materials, including medical and sales literature to help them educate physicians regarding the indications we are targeting and imetelstat, if approved;
- the inability of sales personnel to obtain access to physicians or persuade adequate numbers of physicians to prescribe imetelstat;
- the inability of reimbursement professionals to negotiate arrangements for formulary access, reimbursement and other acceptance by payors;
- the lack of complementary medicines to be offered by sales personnel, which may put us at a competitive disadvantage relative to companies with more extensive product lines;
- the inability to price imetelstat at a sufficient price point to ensure an adequate and attractive level of profitability;
- unforeseen costs and expenses associated with creating an independent sales and marketing organization;
- our inability to maintain existing supply arrangements, or to establish new supply arrangements with third-party suppliers and contract manufacturers to ensure sufficient commercial supplies;
- our inability to obtain and maintain patent protection, trade secret protection and regulatory exclusivity, both in the U.S. and in other countries;
- lack of an acceptable safety profile following any regulatory approval; and
- our inability to compete effectively with other therapies.

If we enter into arrangements with third parties to perform commercialization services like sales, marketing and distribution, we will be reliant on the efforts of such third parties, and our sales revenue from sales of imetelstat or the profitability from such sales to us are likely to be lower than if we were to market and sell imetelstat ourselves. In addition, we may not be successful in entering into arrangements with third parties to commercialize imetelstat or may be unable to do so on terms that are favorable to us. In entering into third-party commercialization arrangements, any revenue we receive will depend upon the efforts of the third parties, and we cannot assure you that such third parties will establish adequate commercialization capabilities or devote the necessary resources and attention to commercialize imetelstat effectively. We also face competition in our search for third parties to assist us with the commercialization efforts of imetelstat.

Our inability to successfully establish commercialization capabilities for imetelstat, if we receive regulatory approval to do so, would severely and adversely affect our financial results, business and business prospects, including the potential commercialization of imetelstat, and the future of imetelstat.

If acceptable prices or adequate reimbursement for imetelstat is not obtained, the use of imetelstat could be severely limited.

The ability to successfully commercialize imetelstat, if approved, will depend significantly on obtaining acceptable prices and the availability of coverage and adequate reimbursement to the patient from third-party payors. Government payors, such as the Medicare and Medicaid programs, and other third-party payors, such as private health insurers and health maintenance organizations, determine which medications they will cover and the reimbursement levels. Assuming we obtain coverage for imetelstat by a third-party payor, the resulting reimbursement payment rates may not be adequate or may require co-payments that patients find unacceptably high. If imetelstat is approved for commercial sale, patients are unlikely to use it unless coverage is provided, and reimbursement is adequate to cover all or a significant portion of its cost. Therefore, coverage and adequate reimbursement will be critical to new product acceptance.

Government authorities and other third-party payors are developing increasingly sophisticated methods of controlling healthcare costs, such as by limiting coverage and the amount of reimbursement for particular medications. Increasingly, third-party payors are requiring that drug companies provide them with predetermined discounts from list prices as a condition of coverage, are using restrictive formularies and preferred drug lists to leverage greater discounts in competitive classes, and are challenging the prices charged for medical products. Further, no uniform policy requirement for coverage and reimbursement for drug products exists among third-party payors in the U.S. Therefore, coverage and reimbursement for drug products can differ significantly from payor to payor. As a result, the coverage determination process is often a time-consuming and costly process that will require us to provide scientific and clinical support for the use of imetelstat to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance.

We cannot be sure that coverage and reimbursement will be available for imetelstat, if approved for commercial sale, and, if reimbursement is available, what the level of reimbursement will be. There may also be significant delays in obtaining coverage and reimbursement for newly approved drugs, and coverage may be more limited than the purposes for which the drug is approved by the FDA or similar international regulatory authorities. Coverage and reimbursement may impact the demand for, or the price of imetelstat, if marketing approval is obtained. If coverage and reimbursement are not available or reimbursement is available only to limited levels, we may not successfully commercialize imetelstat, even if marketing approval is obtained, which would negatively impact our business and business prospects.

Although orphan drug designation has been granted to imetelstat for the treatment of MF and MDS in the U.S. and in the EU, these designations may not be maintained, which would eliminate the benefits associated with orphan drug designation, including the potential for market exclusivity, which would likely result in decreased sales revenue from commercialization of imetelstat, if any, and would likely harm our business and business prospects.

The FDA granted orphan drug designation to imetelstat in June 2015 for the treatment of MF and for the treatment of MDS in December 2015, and the EMA granted orphan drug designation in December 2015 to imetelstat for the treatment of MF and in July 2020 for the treatment of MDS. The designation of imetelstat as an orphan drug does not guarantee that any regulatory authority will accelerate regulatory review of, or ultimately approve, imetelstat, nor does it limit the ability of any regulatory authority to grant orphan drug designation to product candidates of other companies that treat the same indications as imetelstat prior to imetelstat receiving any exclusive marketing approval.

We may lose orphan drug exclusivity for certain reasons, including if the FDA or EMA determines that the request for orphan drug designation was materially defective or if we cannot ensure sufficient quantities of imetelstat to meet the needs of patients with MF or MDS. Failure to maintain orphan designation status in the EU at the time of submitting the MAA, or failure to complete the agreed pediatric plan, would lead to the loss of the additional two-year exclusivity period.

Even if we maintain orphan drug exclusivity for imetelstat, the exclusivity may not effectively protect imetelstat from all competition because different drugs with different active moieties can be approved for the same condition. Even after an orphan drug product is approved, the FDA or EMA can subsequently approve a different drug with the same active moiety for the same condition, if the FDA or EMA concludes that the later drug is safer, more effective, or makes a major contribution to patient care. The occurrence of any of these events could result in decreased sales of imetelstat, should it ever receive marketing approval, and may harm our business and business prospects. In addition, orphan drug designation will neither shorten the development time nor regulatory review time for imetelstat, and it does not give imetelstat any advantage in the regulatory review or approval process.

A Fast Track designation by the FDA, such as the Fast Track designations received for imetelstat for MDS and MF, does not guarantee marketing approval and may not lead to a faster development, regulatory review or approval process.

In October 2017, the FDA granted Fast Track designation to imetelstat for the treatment of adult patients with transfusion-dependent low red blood cell counts, or anemia, due to non-del(5q) lower risk MDS and who are refractory or resistant to treatment with an ESA. In September 2019, the FDA granted Fast Track designation to imetelstat for the treatment of adult patients with relapsed/refractory MF.

Fast Track designation provides opportunities for frequent interactions with FDA review staff, as well as eligibility for priority review, if relevant criteria are met, and rolling review of the sponsor's NDA. Fast Track designation is intended to facilitate and expedite development and review of an NDA to address unmet medical needs in the treatment of serious or life-threatening conditions. However, Fast Track designation does not accelerate conduct of clinical trials or mean that the regulatory requirements are less stringent, nor does it ensure that any imetelstat NDA will be approved or that any approval will be granted within any particular timeframe. In addition, the FDA may withdraw Fast Track designation for any indication if it believes that the designation is no longer supported by data emerging from the imetelstat clinical development program.

The Innovation Passport designation from the United Kingdom regulatory authorities does not guarantee marketing approval and may not lead to a faster development, regulatory review or approval process.

In October 2021, we gained access to the ILAP through the receipt of an Innovation Passport for imetelstat to treat lower risk MDS. The ILAP is a new program sponsored by the Medicines and Healthcare products Regulatory Agency, or MHRA, in the U.K., post-Brexit. The objective of this new licensing and access pathway is to reduce the time to market and enable earlier patient access for innovative medicines. The Innovation Passport is the first prescribed entry point in the ILAP process. Key benefits of being within ILAP include a potential 150-day accelerated assessment and rolling review of an MAA, as well as opportunities for frequent interactions with the review staff at the MHRA and its partner agencies to discuss imetelstat's development, regulatory and reimbursement plans.

Although the goal of ILAP and the Innovation Passport is to reduce the time to market and enable earlier patient access, it does not accelerate conduct of clinical trials or mean that the regulatory requirements are less stringent, nor does it ensure that any imetelstat MAA will be approved or that any approval will be granted within any particular timeframe. Despite receiving Innovation Passport designation, we may decide to delay or forego the commercialization of imetelstat in the U.K.

Failure to achieve continued compliance with government regulations could delay or halt potential commercialization of imetelstat.

Approved products and their manufacturers are subject to continual review, and discovery of previously unknown problems with a product or its manufacturer may result in restrictions on the product or manufacturer, including import restrictions, seizure and withdrawal of the product from the market. If approved for commercial sale, future sales of imetelstat will be subject to government regulation related to numerous matters, including the processes of:

- manufacturing;
- advertising and promoting;
- selling and marketing;
- medical information;
- labeling; and
- distribution.

If, and to the extent that, we are unable to comply with these regulations, our ability to earn potential revenue from the commercialization of imetelstat, if any, would be materially and adversely impacted.

In addition, if imetelstat causes serious or unexpected side effects or is associated with other safety risks after receiving marketing approval, a number of potential significant negative consequences could result, including, but not limited to:

- regulatory authorities may withdraw their approval of imetelstat;
- we may be required to recall imetelstat, seek to change the way it is administered, conduct additional clinical trials or change the labeling of the product;
- regulatory authorities may require revisions to the labeling of imetelstat, including limitations on approved uses or the addition of further warnings, contraindications or other safety information, or may impose restrictions on distribution in the form of REMS in connection with approval, if any;
- we may experience manufacturing delays and supply disruptions if regulatory inspectors identify regulatory noncompliance by third party manufacturers requiring remediation;
- imetelstat may be rendered less competitive and sales may decrease;
- our reputation may suffer generally both among clinicians and patients;
- we may be exposed to potential lawsuits and associated legal expenses, including costs of resolving claims;
- the FDA or similar international regulatory authorities may refuse to approve pending applications or supplements to approved applications filed by us, or may suspend or revoke license approvals; or
- we may be required to change or stop ongoing clinical trials of imetelstat, which would negatively impact the development of imetelstat for other potential indications.

Any of these events could prevent us from achieving or maintaining market acceptance for imetelstat or could substantially increase the costs and expenses of commercializing imetelstat, which in turn could delay or prevent us from generating any revenues from the sale of the imetelstat.

Moreover, the FDA strictly regulates the promotional claims that may be made about drug products. In particular, a product may not be promoted for uses that are not approved by the FDA as reflected in the product's approved labeling. The FDA and other agencies actively enforce regulations prohibiting the promotion of any drug product for off-label uses. If we were found to have improperly promoted off-label use of imetelstat, we would be subject to significant civil, criminal and administrative penalties, which would inhibit our ability to commercialize imetelstat and generate revenue, require us to expend significant time and resources in response, and generate negative publicity. Enforcement actions include, among others:

- adverse regulatory inspection findings;
- fines, warning letters, or untitled letters;
- voluntary or mandatory product recalls or public notification or medical product safety alerts to healthcare professionals;
- restrictions on, or prohibitions against, marketing imetelstat;
- restrictions on, or prohibitions against, importation or exportation of imetelstat;
- suspension of review or refusal to approve pending applications or supplements to approved applications;
- exclusion from participation in government-funded healthcare programs;
- exclusion from eligibility for the award of government contracts for imetelstat;
- suspension or withdrawal of product approvals;
- product seizures;
- injunctions; and
- civil and criminal penalties and fines.

The imposition of any of these penalties or other commercial limitations would severely and adversely affect our financial results, business and business prospects, including the potential commercialization of imetelstat, and the future of imetelstat, and might cause us to cease operations.

If, in the future, we seek regulatory approval to market imetelstat internationally, we may experience a variety of risks that would materially adversely affect our business.

If, in the future, we seek regulatory approval of imetelstat outside of the U.S., and if the necessary approvals are obtained, we will be subject to additional risks related to operating in countries outside of the U.S., including:

- foreign regulatory approvals, if any, may take longer and be more costly to obtain than approvals in the U.S., due to differing regulatory requirements in foreign countries, such as the lack of pathways for accelerated drug approval;
- regulatory authorities outside of the U.S. may disagree with the design, implementation or results of our clinical trials or our interpretation of data from nonclinical studies or clinical trials;
- approval policies or regulations of regulatory authorities outside of the U.S. may significantly change in a manner rendering our clinical data insufficient for potential approval;
- the COVID-19 pandemic may negatively impact our ability to produce imetelstat and conduct clinical trials in countries outside of the U.S.;
- we may experience unexpected changes in tariffs, trade barriers, price and exchange controls and other regulatory requirements;
- general economic weakness, including inflation, rising interest rates, the prospect of a recession or civil or political instability in particular economies and markets outside of the U.S., including as a result of the conflict between Russia and Ukraine;
- risks of potential noncompliance with legal requirements applicable to privacy, data protection, information security and other matters;
- risks of potential noncompliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- increased taxes outside of the U.S., including withholding of payroll taxes;
- significant foreign currency fluctuations, which could result in increased operating expenses and reduced revenue, and other obligations incident to doing business in another country;
- difficulties staffing and managing operations outside of the U.S.;
- complexities associated with managing multiple payor reimbursement regimes and government payors in foreign countries;
- workforce uncertainty in countries where labor unrest is more common than in the U.S.;
- potential liability under the Foreign Corrupt Practices Act of 1977 or comparable regulations outside of the U.S.;
- challenges enforcing our contractual and intellectual property rights, especially in those countries outside of the U.S. that do not respect and protect intellectual property rights to the same extent as the U.S.;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad; and
- business interruptions resulting from geopolitical actions, including war and terrorism including the conflict between Russia and Ukraine.

These and other risks associated with international operations may materially adversely affect our ability to attain or maintain profitable operations.

We are also subject to numerous regulatory requirements outside of the U.S. governing, among other things, the conduct of clinical trials, manufacturing and marketing authorization, pricing and third-party reimbursement. The regulatory approval process varies among countries and may include all of the risks associated with FDA approval described above as well as risks attributable to the satisfaction of local regulations in jurisdictions outside

of the U.S. Moreover, the time required to obtain approval may differ from that required to obtain FDA approval. Approval by the FDA does not ensure approval by regulatory authorities outside the U.S. and vice versa.

In Europe, the Clinical Trials Regulation, which came into effect in January 2022, introduced substantial changes in how clinical trials are authorized in the European Economic Area, or EEA, enabling sponsors to submit a single application to run a clinical trial in several European countries. The objectives of the new regulation include consistent rules for conducting trials throughout the European Union, consistent data standards and adverse events listing, and consistent information on the authorization status. Information on the conduct and results of each clinical trial carried out in the EU will be made publicly available. Commencing in January 2023, clinical trial sponsors will need to use the Clinical Trials Information System, or CTIS, to apply to start a new clinical trial in the EEA; and from January 2025, clinical trials in the EEA will need to comply with the Clinical Trials Regulation.

In addition, a new pan-European clinical trial data information database has been created that will be complementary to the database established for pharmacovigilance (Regulation (EC) No 726/2004 with respect to centrally authorized medicinal products). In addition, Commission Implementing Regulation (EU) No 520/2012 outlines the practical implications for marketing authorization holders, national competent authorities, and the EMA. Also, Commission Delegated Regulation (EU) No 357/2014 on post-authorization efficacy studies specifies the situations in which such studies may be required. Post-authorization efficacy studies may be required where concerns relating to some aspects of efficacy of the medicinal product are identified and can be resolved only after the medicinal product has been marketed, or where the understanding of the disease, the clinical methodology or the use of the medicinal product under real-life conditions indicate that previous efficacy evaluations might have to be revised significantly.

Brexit is also expected to disrupt the operation of pre- and post-authorization clinical trial infrastructure. The rules around GMP and pharmacovigilance in the U.K. currently remain similar to the EU requirements. However, the Falsified Medicines Directive will not apply in Great Britain though it is likely that the U.K. will implement a procedure to minimize the risk of falsified medicines.

Uncertainty in the regulatory framework and future legislation could lead to disruption in the execution of international multi-center clinical trials, the monitoring of adverse events through pharmacovigilance programs, the evaluation of the benefit-risk profiles of new medicinal products, and determination of marketing authorization across different jurisdictions. Changes to existing regulations may add considerably to the development lead time to marketing authorization and commercialization of products in the EU and increase our costs. We cannot predict the impact of such changes and future regulation on our business or the results of our operations.

We may be subject to requests for access to imetelstat. Demand for compassionate use of imetelstat could strain our resources, delay our drug development activities, negatively impact our regulatory approval or commercial activities, and result in losses.

We are developing imetelstat to treat life-threatening hematologic malignancies for which there are currently limited therapeutic options. Other companies in our field have been the target of campaigns requesting access to unapproved drugs. If we experience similar request for access campaigns, we may experience significant disruption to our business which could result in losses. We are a small company with limited resources, and any unanticipated trials or access programs resulting from requests for access could deplete our drug supply, increase our capital expenditures, reduce the availability of potentially eligible clinical trial participants, and otherwise divert our resources from our primary goals.

In addition, legislation referred to as “Right to Try” laws have been introduced at the local and national levels, which are intended to give patients access to unapproved therapies. New and emerging legislation regarding expanded access to unapproved drugs for life-threatening illnesses could negatively impact our business in the future. Either activism or legislation related to requests for access may require us to initiate an unanticipated expanded access program or to make imetelstat more widely available sooner than anticipated.

Patients who receive access to unapproved drugs through compassionate use or expanded access programs have life-threatening illnesses and generally have exhausted all other available therapies. The risk for serious adverse events, including those which may be unrelated to imetelstat, in this patient population is high and could have a negative impact on the safety profile of imetelstat, which could cause significant delays or an inability to successfully commercialize imetelstat and could materially harm our business. In addition, if, in order to perform the controlled clinical trials required for potential regulatory approval and successful commercialization of imetelstat, we do not provide compassionate use access or expanded access programs in response to requests for access from patients in the U.S. or elsewhere in the world, we may receive adverse publicity or experience other disruptions. Should we agree to provide compassionate use access or decide to initiate an expanded access program, we could

experience adverse publicity or other disruptions related to potential participants in such programs. Similarly, we could experience adverse publicity or other disruptions if we were to restructure or pause any compassionate use and/or expanded access program after initiating such a program or after the provision of our product through compassionate access to an individual patient or patients.

If we fail to comply with federal, state and international healthcare laws, including fraud and abuse, transparency, and health information privacy and security laws, we could face substantial penalties and our business, results of operations, financial condition and prospects could be adversely affected.

Our business operations and current and future arrangements with investigators, healthcare professionals, consultants, third-party payors and customers, may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations, including federal and state fraud and abuse laws, including anti-kickback and false claims laws; data privacy and security laws, including the Health Insurance Portability and Accountability Act, or HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, or HITECH; and transparency laws related to payments and/or other transfers of value made to physicians, other healthcare professionals and teaching hospitals. These laws may constrain the business or financial arrangements and relationships through which we conduct our operations, including how we research, market, sell and distribute imetelstat, if marketing approval is obtained. For details regarding the restrictions under applicable federal and state healthcare laws and regulations that may affect our ability to operate see Item 1 "Business—Government Regulation— Fraud and Abuse, Data Privacy and Security, and Transparency Laws and Regulations" in our Annual Report on Form 10-K for the year ended December 31, 2022.

Federal and state enforcement bodies have increased their scrutiny of interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry. If our operations are found to be in violation of any of these or any other healthcare and privacy-related regulatory laws that may apply to us, we may be subject to significant penalties, including the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, disgorgement, imprisonment, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, reputational harm, diminished profits and future earnings, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations. Defending against any such actions can be costly, time-consuming and may require significant financial and personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired.

RISKS RELATED TO MANUFACTURING IMETELSTAT

Failure by us to establish and/or maintain a manufacturing supply chain to appropriately and adequately supply imetelstat for future clinical and commercial uses would result in a further delay in or cessation of clinical trials and a delay in our ability to obtain regulatory approvals of imetelstat, and affect our ability to commercialize imetelstat, and our business and business prospects could be severely harmed, and we could cease operations.

The manufacture of imetelstat must comply with applicable regulatory standards for current and potential future clinical trials and potential commercial uses. The process of manufacturing imetelstat is complex and remains subject to several risks, including:

- the ability to scale-up and attain sufficient production yields with appropriate quality control and quality assurance to meet the needs of our clinical trials and potential future market demand, and to establish commercial supply agreements;
- reliance on third-party manufacturers and suppliers, whose efforts we do not control;
- supply chain issues, including the timely availability and shelf life requirements of raw materials and other supplies, any of which may be impacted by a number of factors, including the effects of macroeconomic conditions such as the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia;
- shortage of qualified personnel; and
- regulatory acceptance and compliance with regulatory requirements, which are less well-defined for oligonucleotide products than for small molecule drugs and vary in each country where imetelstat might be sold or used.

As a result of these and other risks, we may be unable to establish and/or maintain a manufacturing infrastructure and supply chain capable of providing imetelstat for IMerge Phase 3, IMpactMF, IMproveMF and IMpress, and potential future commercial uses, which would delay or result in a cessation of such current or potential future clinical trials of imetelstat. Occurrence of any such events would further delay or preclude any applications for regulatory approval and therefore further delay or preclude our ability to earn revenue from the commercialization, if any, of imetelstat, which would severely and adversely affect our financial results, business and business prospects, and might cause us to cease operations.

If third parties that manufacture imetelstat fail to perform as needed, then the clinical and commercial supply of imetelstat will be limited, and we may be unable to conduct or complete current or potential future clinical trials of imetelstat or to commercialize imetelstat in the future.

Our imetelstat manufacturing supply chain relies, and will continue to rely, solely upon third-party manufacturers to perform certain process development or other technical and scientific work with respect to imetelstat, as well as to supply starting materials and manufacture drug substance and drug product. While we have established arrangements with third parties for the manufacture of imetelstat, our manufacturing supply chain is highly specialized, and as such we are reliant upon a small group of third-party manufacturers to supply starting materials, drug substance and drug product. Failure by such third-party manufacturers to perform in a timely manner and in compliance with all regulatory requirements, or at all, could further delay, perhaps substantially, or preclude our ability to pursue imetelstat development on our own, increase our costs and otherwise negatively affect our financial results, business and business prospects. In this regard, a recent FDA inspection of one of our third-party manufacturers identified certain deficiencies in the manufacturer's processes and facilities which, while not directly related to the production of imetelstat, could impact the manufacturer's ability to produce and deliver products, including imetelstat, if not remediated by the manufacturer, and could lead to delays or shortages in drug supply, or the inability to manufacture or ship drug supply necessary for non-clinical and clinical activities, and commercialization. In addition, we may not be able to obtain imetelstat from third-party manufacturers on acceptable terms, or at all. We expect to rely on third-party manufacturers to produce and deliver sufficient quantities of imetelstat and other materials to support clinical trials on a timely basis and to comply with applicable regulatory requirements. We do not have direct control over these third-party personnel or operations. Reliance on these third-party manufacturers is subject to numerous risks, including:

- being unable to contract with suitable third-party manufacturers, including for potential commercial supply of imetelstat, because the number of potential manufacturers is limited;
- delays and disruptions experienced by third-party manufacturers due to the effects of the COVID-19 pandemic, which have adversely impacted and could continue to adversely impact the ability of such parties to fulfill their contractual obligations to us;
- capacity limitations and scheduling constraints experienced by third-party manufacturers due to scheduling and other commitments, and queued manufacturing activities in contracted facilities;
- potential shortages of available manufacturing capacity or consumable manufacturing supplies at third-party manufacturers, due to obligations to manufacture and distribute vaccines to address the spread of COVID-19; and we anticipate that other delays, or potential shortages of consumable manufacturing supplies, may continue throughout 2023;
- requirements by regulatory authorities to validate and qualify significant activities for any current or replacement manufacturer, which could involve new testing and compliance inspections;
- the inability to execute timely contracts with third-party manufacturers and suppliers on acceptable terms, or at all;
- the inability of third-party manufacturers to timely formulate and manufacture imetelstat or to produce or ship imetelstat in the quantities or of the quality required to meet clinical and commercial needs, whether due to the effects of the COVID-19 pandemic or any other reasons;
- the possible mislabeling by third-party manufacturers of clinical supplies, potentially resulting in the wrong dose amounts being supplied or active drug or comparator not being properly identified;
- decisions by third-party manufacturers to exit the contract manufacturing business during the time required to supply clinical trials or to successfully produce, store and distribute imetelstat to meet commercial needs;
- compliance by third-party manufacturers with GMP standards mandated by the FDA and state agencies and other government regulations corresponding to similar international regulatory authorities,

including any deficiencies identified during regulatory inspections, such as those identified in a recent FDA inspection of one of our third-party manufacturers;

- breach or termination of manufacturing or supply contracts;
- inadequate storage or maintenance at contracted facilities resulting in theft or spoilage; and
- natural disasters that affect contracted facilities.

Each of these risks could lead to delays or shortages in drug supply, or the inability to manufacture or ship drug supply necessary for non-clinical and clinical activities, and commercialization. For example, manufacturing delays could adversely impact the conduct or completion of imetelstat clinical trials, such as IMerge Phase 3, IMpactMF, IMproveMF and IMpress, or commencement of potential future clinical trials of imetelstat, or preclude or delay potential future commercial sales, which could severely and adversely affect our financial results, business and business prospects, and the future of imetelstat.

In addition, third-party manufacturers and/or any other manufacturers may need to make substantial investments to enable sufficient capacity increases and cost reductions, and to implement those regulatory and compliance standards necessary for successful Phase 3 clinical trials and commercial production of imetelstat. These third-party manufacturers may not be willing or able to achieve such capacity increases, cost reductions, or regulatory and compliance standards, and even if they do, such achievements may not be at commercially reasonable costs. Changing manufacturers may be prolonged and difficult due to inherent technical complexities and because the number of potential manufacturers is limited. It may be difficult or impossible for us to find a replacement manufacturer on acceptable terms, or at all.

It may not be possible to manufacture imetelstat at costs or scales necessary to conduct clinical trials or potential future commercialization activities.

Oligonucleotides are relatively large molecules produced using complex chemistry, and the cost of manufacturing an oligonucleotide like imetelstat is greater than the cost of making typical small molecule drugs. Therefore, imetelstat for clinical use is more expensive to manufacture than most other treatments currently available today or that may be available in the future. Similarly, the cost of manufacturing imetelstat for commercial use will need to be significantly lower than current costs in order for imetelstat to become a commercially successful product. We may not be able to enter into suitable commercial supply agreements, or to achieve sufficient scale increases or cost reductions necessary for successful commercial production of imetelstat. Failure to achieve necessary cost reductions could result in decreased sales or reduced gross margins, if any, for us, which would materially and adversely affect our financial results, business and business prospects, and the future of imetelstat.

RISKS RELATED TO COVID-19

The effects of the ongoing COVID-19 global pandemic have negatively impacted, and will likely continue to negatively impact, our business and healthcare resources around the world, including a significant number of current and planned clinical sites involved with IMpactMF, IMproveMF and IMpress.

Our business and business prospects, our financial condition and ability to raise additional capital, and the future of imetelstat generally could be materially and adversely affected by the effects of the ongoing global COVID-19 pandemic. The ongoing COVID-19 pandemic and public health safety measures taken in response to COVID-19 have had a significant impact, both direct and indirect, on businesses, as significant reductions in business-related activities have occurred, clinical development and regulatory activities have been curtailed, delayed or suspended and supply chains have been disrupted. We have allowed voluntary access to our offices in California and New Jersey to employees who have been vaccinated. While almost all of our employees continue to work remotely without any significant disruption to our business, the effects of our policies regarding remote working may negatively impact productivity, disrupt our business and continue to delay our imetelstat development program and clinical trial timelines, the magnitude of which will depend, in part, on the length and severity of the restrictions and other limitations on our ability to conduct our business in the ordinary course. In addition, our increased reliance on personnel working remotely could increase our cybersecurity risk, create data accessibility concerns and make us more susceptible to communication disruptions, any of which could adversely impact our business operations. These and similar, and perhaps more severe, disruptions in our operations could continue to negatively impact our business and business prospects, our financial condition and the future of imetelstat.

Due to the effects of the COVID-19 pandemic, we have had, and expect to continue to have, or we may potentially have in the future, disruptions and/or delays in our imetelstat development program, including with respect to our ability to:

- open trial sites for screening and enrollment;
- screen, enroll and assess patients;
- retain enrolled patients in our clinical trials;
- ensure patient visits to clinical sites and laboratories;
- conduct monitoring visits;
- manufacture and/or supply study drug or other supplies;
- report trial results; or
- interact with regulators or other important agencies due to limitations in employee resources or otherwise.

Restrictions on travel, availability of site personnel, and diversion of hospital staff and resources to COVID-19 patients, have disrupted our clinical trial operations, as well as patient recruitment in many areas, resulting in a slowdown in patient enrollment and/or deviations from or disruptions in key clinical trial activities, such as opening, initiating and monitoring clinical trial sites. Although vaccine distribution, including booster shots, is being conducted in many countries, the emergence of COVID-19 variants and subvariants, and the resurgence of COVID-19 cases in parts of the world, causes further uncertainty and unpredictability in clinical trial activities, including clinical site initiations, patient screening and enrollment. Like many other biopharmaceutical companies, we have experienced and continue to experience delays in clinical site initiations and patient screening and enrollment in our clinical trials, IMerge Phase 3, IMpactMF and IMproveMF, due to the COVID-19 pandemic, which have impacted our trial operations. Even though we completed patient enrollment in IMerge Phase 3, the pace of enrollment was slower than planned.

For IMpactMF, in addition to the negative impact of COVID-19, site personnel resources remain constrained in the countries where we planned to conduct the trial due to the number of competing trials in MF and other oncology indications. As such, we have experienced and expect to continue to experience disruption in clinical trial activities and delays in enrollment, as well as constraints on available sites and site personnel. Based on assumptions for enrollment and event (death) rates in the trial, we expect the interim analysis for OS for IMpactMF may occur in 2024 and the final analysis may occur in 2025. Because these analyses are event-driven and it is uncertain whether actual rates for enrollment and events will reflect current planning assumptions, the results may be available at different times than currently expected.

The continuing effects of the COVID-19 pandemic could cause further disruptions to our clinical development timelines, including continued delays in enrollment and clinical trial site initiation in IMpactMF, IMproveMF and IMpress, and other disruptions that could severely impact our business and the imetelstat development program, including those resulting from:

- new, continued or heightened difficulties in opening clinical trial sites for patient screening and enrollment and recruiting clinical site investigators and clinical site staff;
- continued or heightened delays or difficulties caused by missed patient visits to clinical sites and laboratories, and uncertainty how the FDA will view deviations from clinical protocols caused by the effects of the COVID-19 pandemic;
- potential refusal by the FDA to accept data, including from clinical trials in affected geographies or failure to comply with updated FDA guidance and expectations related to the conduct of clinical trials during the COVID-19 pandemic;
- continued or heightened delays or disruptions in clinical trial activities, including executing clinical site contracts, due to reduced availability of personnel at CROs, clinical site legal groups and vendors, or for any other reasons;
- substantial reduction of healthcare resources available for the conduct of clinical trials, including the temporary postponement of clinical trial activities at certain hospitals serving as our clinical trial sites and diversion of hospital staff away from the conduct of our clinical trials, such as those experienced by us to date;

- interruption of, or delays in receiving, supplies of imetelstat from our third-party manufacturers due to among other things, staffing shortages, production slowdowns or stoppages, shipping delays, shortages in raw materials or laboratory supplies because of ongoing efforts to address the pandemic, limitations in available capacity at contract manufacturing vendors or drug distribution service providers due to obligations to manufacture and distribute vaccines to address the spread of COVID-19, disruptions in supply chain and production systems and import/export complications;
- interruption of key clinical trial activities, such as clinical trial site data monitoring, due to limitations on travel imposed or recommended by federal or state governments, employers and others or interruption of clinical trial subject visits and study procedures (particularly any procedures that may be deemed non-essential), which may impact the integrity of subject data and clinical study endpoints;
- loss of potential and recruited patients in clinical trials due to clinical site COVID-19 activities, desire of patients to avoid frequent visits to hospitals because of potential increased exposure to COVID-19, or loss of life of patients due to COVID-19;
- increased costs for clinical trial activities due to delays or disruptions in opening sites, screening and enrolling patients or treating and following patients, whether as a result of the effects of the COVID-19 pandemic or for any other reasons, which would require further additional capital that may not be available; and
- limitations on employee resources that would otherwise be focused on the conduct of our clinical trials, product development, manufacturing, potential commercialization activities and general company operations, including because of sickness of employees or their families, the desire of employees to avoid contact with large groups of people, an increased reliance on working from home, or mass transit disruptions.

These and other factors arising from the effects of the COVID-19 pandemic could further adversely impact our ability to enroll, conduct and complete IMpactMF, IMproveMF and IMpress and any potential future clinical trials of imetelstat, and could otherwise materially and adversely affect our business and business prospects, our financial condition and the future of imetelstat.

In addition, we rely on third-party CROs and other third parties to assist us with clinical trial activities. The COVID-19 pandemic has also had a significant impact on our CROs and other vendors, and we cannot guarantee that they will continue to perform their contractual duties in a timely and satisfactory manner as a result of the COVID-19 pandemic. Also, absenteeism by governmental employees or the focus of regulatory authorities' efforts and attention on the approval of other therapeutics or other activities related to COVID-19 could likewise impact the timeliness of regulatory authority responses and the processing of regulatory submissions for imetelstat. In any event, if the effects of the COVID-19 pandemic become more severe, we may experience more significant disruptions to our clinical development timelines, which would materially and adversely affect our business and business prospects, our financial condition and ability to raise additional capital, and the future of imetelstat.

While at this time we believe that we have sufficient drug supply for potential commercialization activities necessary to potentially bring imetelstat to market in lower risk MDS in the U.S., as well as for clinical use in IMerge Phase 3, IMpactMF, IMproveMF and IMpress, we could experience disruptions to our supply chain, as well as delays or limitations in our ability to obtain sufficient materials for the manufacture of imetelstat for our current and potential future clinical trials. Such disruptions could adversely affect our ability to conduct ongoing and potential future clinical trials of imetelstat. For example, some of our suppliers of certain materials used in the production of imetelstat are located in countries that were or are heavily affected by the COVID-19 pandemic. In these countries, shipping delays, closures and other restrictions resulting from the COVID-19 pandemic in the region could disrupt our supply chain or limit our ability to obtain sufficient materials for the manufacture of imetelstat. In addition, we may experience limitations in available capacity at contract manufacturers or drug suppliers, or potential shortages of consumable manufacturing supplies, due to obligations to manufacture and distribute vaccines to address the spread of COVID-19. We anticipate other delays, or potential shortages of consumable manufacturing supplies due to the COVID-19 pandemic may continue throughout 2023.

The effects of the COVID-19 pandemic, as well as broader economic conditions, including inflation, rising interest rates and the prospects for recession, have increased market volatility and could result in a significant long-term disruption of global financial markets, reducing or eliminating our ability to raise additional capital. In the absence of future proceeds from potential cash exercises of currently outstanding warrants and potential drawdowns under the Loan Agreement, we will require substantial additional funding to further advance the imetelstat program, including through the completion of IMpactMF, IMproveMF and the investigator-led trial IMpress, as well as conducting the clinical, regulatory and potential commercialization activities necessary to potentially bring

imetelstat to market in relapsed/refractory MF and any other future indications, and our need for additional funds may arise sooner than planned. We cannot predict with any certainty whether and to what extent the outstanding warrants will be exercised for cash, or the timing of availability of additional funds under the Loan Agreement, if at all. In addition, the global economic slowdown caused by, among other things, the COVID-19 pandemic and the military conflict between Ukraine and Russia, inflation, rising interest rates and the prospects for recession, as well as recent and potential future disruptions in access to bank deposits or lending commitments due to bank failure, could materially and adversely affect our business and the value of our common stock. As a result of these factors, our ability to raise additional capital may be impaired which could negatively affect our liquidity, our business and business prospects, and the future of imetelstat.

The extent to which the COVID-19 pandemic impacts our business, our regulatory and clinical development activities, clinical supply chain and other business operations, as well as the value of and market for our common stock, will depend on future developments that are highly uncertain and cannot be predicted with confidence at this time. Such developments include continued spread of COVID-19 variants and subvariants in the U.S. and other countries and the potential emergence of new variants or additional sub-variants that may prove especially contagious or virulent, the ultimate duration and severity of the pandemic, travel restrictions, quarantines, social distancing, shipping delays and business closure requirements in the U.S. and in other countries, and the effectiveness of vaccination programs and other actions taken globally to treat and manage this health crisis. Accordingly, we do not yet know the full extent of potential delays or impacts on our business, our regulatory and clinical development activities, clinical supply chain and other business operations or the global economy as a whole. However, these effects could materially and adversely affect our business and business prospects, our financial condition and ability to raise additional capital, and the future of imetelstat. In addition, to the extent the effects of the COVID-19 pandemic adversely affect our business and financial condition, they may also have the effect of heightening many of the other risks and uncertainties described elsewhere under the heading “Risk Factors”.

RISKS RELATED TO OUR FINANCIAL POSITION AND NEED FOR ADDITIONAL FINANCING

Our failure to obtain additional capital would force us to further delay, reduce or eliminate development of imetelstat in current and any potential future clinical trials of imetelstat, and our potential future imetelstat commercialization efforts, any of which would severely and adversely affect our financial results, business and business prospects, and might cause us to cease operations.

Successful drug development and commercialization requires significant amounts of capital. As of December 31, 2022, we had approximately $173.1 million in cash, cash equivalents, restricted cash and current and noncurrent marketable securities. On January 10, 2023, we completed an underwritten public offering of 68,007,741 shares of our common stock and a pre-funded warrant to purchase 25,000,000 shares of our common stock, or the 2023 pre-funded warrant. The net cash proceeds from this offering are approximately $213.3 million, after deducting the underwriting discount and other offering expenses paid by us, and excludes any future proceeds from the exercise of the 2023 pre-funded warrant. In addition, from January 1, 2023 through March 9, 2023, we have received $59.8 million in cash proceeds from the exercise of outstanding warrants.

Based on our current operating plan and our expectations regarding the timing of the submission and potential acceptance and approval of our planned NDA by the FDA for imetelstat in lower risk MDS and the potential commercialization in the U.S. for the use of imetelstat in adult patients with lower risk MDS, we believe that our existing cash, cash equivalents, restricted cash and current and noncurrent marketable securities, including the net cash proceeds from our recently closed underwritten public offering in January 2023 and the cash proceeds from the exercise of warrants that we received in the January and February 2023, will be sufficient to fund our projected operating requirements through the end of the third quarter of 2025, which includes potential U.S. commercial launch of imetelstat in lower risk MDS in the first half of 2024. In the absence of potential proceeds from exercises of currently outstanding warrants and potential drawdowns under the Loan Agreement, we will require substantial additional funding to further advance the imetelstat program, including through the completion of IMpactMF, IMproveMF and the investigator-led trial IMpress, as well as conducting the clinical, regulatory and potential commercialization activities necessary to potentially bring imetelstat to market in relapsed/refractory MF and any other future indications, and our need for additional funds may arise sooner than planned. We cannot predict with any certainty whether and to what extent the outstanding warrants will be exercised for cash, or the timing or availability of additional funds under the Loan Agreement, if at all, particularly given the recent closure of SVB by banking regulators.

In addition, our ability to commercialize imetelstat in the U.S., if regulatory approval is granted, depends on us being able to establish sales and marketing capabilities which we may be unable to do in a timely manner or at all.

Because the outcome of any clinical activities and/or regulatory approval process is highly uncertain, we cannot reasonably estimate whether any development activities we may undertake will succeed, whether we will be able to commercialize imetelstat, and we may never recoup our investment in any imetelstat development, which would adversely affect our financial condition and our business and business prospects, and might cause us to cease operations. In addition, our plans and timing expectations could be further delayed or interrupted by macroeconomic conditions, such as if COVID-19 or pandemic conditions worsen, creating further limitations on our clinical trial or commercial preparatory activities, or if U.S. and/or international banking system fails to stabilize in light of recent and potential future bank failures, or could be disrupted by civil or political unrest or military conflicts around the world, such as the current military conflict between Ukraine and Russia. Further, our future capital requirements are difficult to forecast and will depend on many factors, including:

- the accuracy of the assumptions underlying our estimates for our capital needs;
- the scope, progress, timing, magnitude and costs of clinical development, manufacturing and potential commercialization of imetelstat, including the number of indications being pursued, subject to clearances and approvals by the FDA and similar international regulatory authorities;
- the scope, progress, duration, results and costs of current clinical trials, including IMerge Phase 3, IMpactMF, IMproveMF and IMpress, and any potential future clinical trials of imetelstat, as well as non-clinical studies and assessments of imetelstat;
- delays or disruptions in opening sites, screening and enrolling patients or treating and following patients, in IMpactMF, IMproveMF, IMpress, or any potential future clinical trials of imetelstat, whether as a result of the effects of macroeconomic conditions like the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia;
- the costs, timing and outcomes of regulatory reviews or other regulatory actions related to imetelstat, such as obtaining and maintaining regulatory clearances and approvals to continue clinical development of imetelstat in current and potential future clinical trials, as well as to commence potential commercialization of imetelstat in the U.S. and in other countries;
- the costs of preparing, filing and prosecuting patent applications and maintaining, enforcing and defending intellectual property-related claims;
- the costs of manufacturing imetelstat, including our ability to achieve any meaningful reduction in manufacturing costs;
- the costs of multiple third-party vendors and service providers, including our CROs and third-party manufacturers, to pursue the development, manufacturing and potential commercialization of imetelstat;
- our ability to establish, enforce and maintain collaborative or other strategic arrangements for research, development, clinical testing and manufacturing of imetelstat and potential future commercialization and marketing;
- our efforts to enhance operational, financial and management processes and systems that will be required for future development and commercialization of imetelstat, and our ability to successfully recruit and retain additional key personnel to support the development and potential future commercialization of imetelstat;
- our ability to successfully market and sell imetelstat, if imetelstat receives future regulatory approval or clearance, in the U.S. and other countries, and the associated costs;
- the costs and timing necessary to build a sales force in the U.S. and potentially other countries to market and sell imetelstat, should it receive regulatory approval, to the extent that such sales, marketing, manufacturing and distribution are not the responsibility of any collaborator;
- the sales price for imetelstat, if any;
- the availability of coverage and adequate third-party reimbursement for imetelstat, if any;
- the extent to which we acquire or in-license other drugs and technologies, or to which we out-license imetelstat;
- the extent to which we acquire or invest in businesses, products or technologies, although we currently have no commitments or agreements relating to any of these types of transactions;

- the extent to which we are able to enter into strategic partnerships, collaborations and alliances or licensing arrangements with third parties including for the commercialization of imetelstat in certain global regions;
- our ability to establish and maintain collaborations on favorable terms, if at all;
- the success of any collaborations that we may enter into with third parties;
- expenses associated with settlement of the pending securities class action lawsuits, and the ongoing derivative lawsuits, as well as any other potential litigation;
- the extent and scope of our general and administrative expenses, including expenses associated with potential future litigation;
- our level of indebtedness and associated debt service obligations;
- the costs of maintaining and operating facilities in California and New Jersey, telecommunications and administrative oversight, as well as higher expenses for travel;
- broader economic conditions, including inflation, rising interest rates, the prospects for recession, and recent and potential future disruptions in access to bank deposits or lending commitments due to bank failure, that may reduce our ability to access debt capital or financing on preferable terms, which may adversely affect future capital requirements and forecasts;
- the costs of enabling our personnel to work remotely, including providing supplies, equipment and technology necessary for them to perform their responsibilities; and
- the amount of proceeds, if any, of cash exercises of our currently outstanding warrants.

Until we can generate a sufficient amount of revenue from imetelstat to finance our cash requirements, which we may never achieve, we expect to finance future cash needs through a combination of public or private equity offerings, debt financings, collaborations, strategic alliances, licensing arrangements and other marketing and distribution arrangements, which may not be possible. Availability of such financing sources may be negatively impacted by any further delays in reporting results from IMpactMF or investors' perception of top-line results from IMerge Phase 3, despite our interpretation of such data being positive, as well as factors such as the global economic slowdown, inflation, rising interest rates and the prospects for recession, as well as recent and potential future disruptions in access to bank deposits or lending commitments due to bank failure.

Additional financing through public or private debt or equity financings, including pursuant to the 2020 Sales Agreement with B. Riley Securities, Inc., or B. Riley, the remaining tranches of up to $55.0 million available under the Loan Agreement, which are subject to the achievement of certain clinical and regulatory milestones and satisfaction of certain capitalization and other requirements, as well as approval by an investment committee comprised of Hercules and SVB (or its successor, if any) for the final $25.0 million tranche; capital lease transactions or other financing sources, may not be available on acceptable terms, or at all. We may be unable to raise equity capital, or may be forced to do so at a stock price or on other terms that could result in substantial dilution of ownership for our stockholders. The receptivity of the public and private debt and equity markets to proposed financings has been substantially affected by uncertainty in the general economic, market and political climate due to the effects of macroeconomic conditions like the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates, prospects of a recession, or recent and potential future disruptions in access to bank deposits or lending commitments due to bank failure, and may in the future be affected by other factors which are unpredictable and over which we have no control. In this regard, the effects of the COVID-19 pandemic have increased market volatility and could result in a significant long-term disruption of global financial markets, which could reduce or eliminate our ability to raise additional funds through financings, and could negatively impact the terms upon which we may raise those funds. Similarly, these macroeconomic conditions have created extreme volatility and disruption in the capital markets and is expected to have further global economic consequences. If the equity and credit markets deteriorate, including as a result of macroeconomic conditions like the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates, prospects of a recessions or recent and potential future disruptions in access to bank deposits or lending commitments due to bank failure, it may make any necessary debt or equity financing more difficult to obtain in a timely manner or on favorable terms, more costly or more dilutive. If we are unable to raise additional capital or establish alternative collaborative arrangements with third-party collaborative partners for imetelstat, the development and potential commercialization of imetelstat may be further delayed, altered or abandoned, which might cause us to cease operations.

In addition, we may seek additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. Due to uncertainty in the general economic, market and political climate, we may determine that it is necessary or appropriate to raise additional funds proactively to meet longer-term anticipated operating plans. To the extent that we raise additional capital through the sale of equity or convertible debt securities, including pursuant to the 2020 Sales Agreement, your ownership interest as a stockholder may be diluted, and the terms may include liquidation or other preferences that materially and adversely affect your rights as a stockholder. In addition, we have borrowed, and in the future may borrow, additional capital from institutional and commercial banking sources to fund imetelstat development and our future growth, including pursuant to our Loan Agreement or potentially pursuant to new arrangements with different lenders. We may borrow funds on terms under agreements, such as the Loan Agreement, that include restrictive covenants, including covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. Moreover, if we raise additional funds through alliance, collaborative or licensing arrangements with third parties, we may have to relinquish valuable rights to imetelstat or our technologies or grant licenses on terms that are not favorable to us.

We cannot assure you that our existing capital resources, including net cash proceeds from our recent underwritten public offering in January 2023, future interest income, future proceeds from potential cash exercises of currently outstanding warrants and potential future sales of our common stock, including under the 2020 Sales Agreement with B. Riley or potential future drawdowns, if available, of the remaining up to $55.0 million under the Loan Agreement (which are subject to the achievement of certain clinical and regulatory milestones and satisfaction of certain capitalization and other requirements, as well as approval by an investment committee comprised of Hercules and SVB (or its successor, if any) for the final $25.0 million tranche), will be sufficient to fund our operating plans. In this regard, on March 10, 2023, the Federal Deposit Insurance Corporation, or FDIC, issued a press release stating that SVB was closed by the California Department of Financial Protection and Innovation, which appointed the FDIC as receiver. Of the remaining term commitments under the Loan Agreement, Hercules and its affiliates hold 65% and 35% were held by SVB. As a result of the closure of SVB, we do not know whether Hercules and SVB's successor, if any, will fund their respective portions of the remaining term commitments or whether and to what extent we will otherwise be able to draw down the remaining $55.0 million under the Loan Agreement, even if we meet the conditions set forth in the Loan Agreement necessary for additional draw downs, and it is possible that we will not be able to access any additional funding under the Loan Agreement, which would require us to obtain additional or alternative financing to advance our development of imetelstat. Moreover, while we did not hold cash deposits or securities at SVB, if other banks and financial institutions enter receivership, become insolvent or otherwise fail in the future in response to financial conditions affecting the banking system and financial markets or otherwise, our ability to access our existing cash, cash equivalents and marketable securities may be delayed or precluded, which could have a material adverse effect on our business, business prospects and financial position.

We currently have no source of product revenue and may never become profitable.

Although in the past we have received license and other payments under former license and collaboration agreements, we do not currently have any material revenue-generating license or collaboration agreements, have no products approved for commercialization and have never generated any revenue from product sales. In addition, we are incurring and have incurred operating losses every year since our operations began in 1990, except for one. As of December 31, 2022, our accumulated deficit was approximately $1.4 billion. Losses have resulted principally from costs incurred in connection with our research and development activities and from general and administrative costs associated with our operations.

Substantially all of our revenues to date have been payments under collaboration agreements and milestones, royalties and other revenues from our licensing arrangements. Our license agreements related to our hTERT technology have expired or been terminated due to expiration of the underlying hTERT patents, and will not generate any further revenues. We have no ongoing collaborations related to imetelstat and have no current plans to enter into any corporate collaboration, partnership or license agreements that result in revenues, although we may seek a collaborative partner or partners, at an appropriate time, to assist us in the potential development and commercialization of imetelstat, especially outside the U.S., and to provide funding for such activities.

We also expect to experience increased negative cash flow for the foreseeable future as we fund our operations and imetelstat clinical development activities and research programs continue, and we prepare for potential commercialization of imetelstat. This will result in decreases in our working capital, total assets and stockholders' equity. Further, we may be unable to replenish our working capital by future financings. We will need to generate significant revenues to achieve consistent future profitability. We may never achieve consistent future profitability. Even if we do become profitable in the future, we may not be able to sustain or increase profitability on

a quarterly or annual basis. Our failure to achieve consistent future profitability could negatively impact the market price of our common stock and our ability to sustain operations.

Our ability to use our net operating loss carryforwards and certain other tax attributes may be limited.

Our net operating loss carryforwards attributable to tax years beginning before January 1, 2018 could expire unused and be unavailable to offset future income tax liabilities. Under the Tax Cuts and Jobs Act of 2017, or the Tax Act, as modified by the Coronavirus Aid, Relief and Economic Security Act, or CARES Act, federal net operating losses incurred in taxable years beginning after December 31, 2017, can be carried forward indefinitely, but the deductibility of such federal net operating losses in taxable years beginning after December 31, 2020, is limited to 80% of taxable income. It is uncertain if and to what extent various states will conform to the Tax Act or the CARES Act.

Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, or the Code, and corresponding provisions of state law, if a corporation undergoes an "ownership change," generally defined as a greater than 50-percentage-point cumulative change (by value) in its equity ownership over a three-year period, the corporation's ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes (such as research and development tax credits) to offset its post-change taxable income or taxes may be limited. Changes in our stock ownership, some of which are outside of our control, may have resulted in, or other future changes could result in, an ownership change. If a limitation were to apply, utilization of a portion of our domestic net operating loss and tax credit carryforwards could be limited in future periods. In addition, a portion of the carryforwards may expire before being available to reduce future income tax liabilities which could adversely impact our financial position. At the state level, there may be periods during which the use of net operating loss carryforwards is suspended or otherwise limited, which could accelerate or permanently increase state taxes owed.

RISKS RELATED TO OUR INDEBTEDNESS

Our level of indebtedness and debt service obligations could adversely affect our financial condition, and may make it more difficult for us to fund our operations.

As of December 31, 2022, the total outstanding principal amount under the Loan Agreement was $50.0 million. The tranches for the remaining $55.0 million available to us under the Loan Agreement are as follows: (a) the first remaining tranche of $10.0 million is available from January 1, 2023 until December 15, 2023, subject to the achievement of certain clinical and regulatory milestones, and satisfaction of certain other requirements; (b) the second remaining tranche of $20.0 million is available from September 15, 2023 until September 15, 2024, subject to the achievement of certain clinical and regulatory milestones, and satisfaction of certain capitalization requirements; and (c) the final remaining tranche of $25.0 million is available through December 31, 2024, subject to approval by an investment committee comprised of Hercules and SVB (or its successor, if any). Without the achievement of the required clinical and regulatory milestones and satisfaction of certain capitalization and other requirements, we will not be eligible to draw funds under the first three remaining tranches. If we do not receive investment committee approval, we will not be eligible to draw funds under the final remaining tranche under the Loan Agreement. In addition, on March 10, 2023, the FDIC issued a press release stating that SVB was closed by the California Department of Financial Protection and Innovation, which appointed the FDIC as receiver. Of the remaining term commitments under the Loan Agreement, Hercules and its affiliates hold 65% and 35% were held by SVB. As a result of the closure of SVB, we do not know whether Hercules and SVB's successor, if any, will fund their respective portions of the remaining term commitments or whether and to what extent we will otherwise be able to draw down the remaining $55.0 million under the Loan Agreement, even if we meet the conditions set forth in the Loan Agreement necessary for additional draw downs, and it is possible that we will not be able to access any additional funding under the Loan Agreement, which would require us obtain additional or alternative financing to advance our development of imetelstat. Such additional or alternative financing may not be available on attractive terms, if at all, and could be more costly for us to obtain. In addition, before we would consider drawing down any of the remaining tranches under the Loan Agreement, if available, we must first satisfy ourselves that we will have access to future alternate sources of capital, such as from the equity capital markets or debt capital markets, in order to repay any additional principal borrowed, which we may be unable to do, in which case, our liquidity and ability to fund our operations may be substantially impaired. As a result, our development and potential commercialization of imetelstat and other research and development programs could be significantly delayed, which would materially adversely affect our business, business prospects, financial condition and operating results.

All obligations under the Loan Agreement are secured by substantially all of our existing property and assets, excluding intellectual property, which is subject to a negative pledge. This indebtedness may create additional financing risk for us, particularly if our business or prevailing financial market conditions are not conducive to paying off or refinancing the outstanding debt obligations at maturity. If we are able to draw down any of the remaining tranches under the Loan Agreement, our indebtedness will increase, which would further increase our risk of being unable to pay off or refinance our outstanding debt obligations at maturity. Our indebtedness could also have important negative consequences, including:

- we will need to repay the indebtedness by making payments of interest and principal, which will reduce the amount of cash available to finance our operations, our research and development efforts and other general corporate activities; and
- our failure to comply with the obligations of our affirmative and restrictive covenants in the Loan Agreement could result in an event of default that, if not cured or waived, would accelerate our obligation to repay this indebtedness, and Hercules and SVB (or its successor, if any) could seek to enforce its security interest in the assets securing such indebtedness.

To the extent additional debt is added to our current debt levels, the risks described above could increase.

The terms of the Loan Agreement place restrictions on our operating and financial flexibility.

The Loan Agreement imposes operating and other restrictions on us. Such restrictions will affect, and in many respects limit or prohibit, our ability and the ability of any future subsidiaries to, among other things:

- dispose of certain assets;
- change our line of business;
- engage in mergers, acquisitions or consolidations;
- incur additional indebtedness;
- create liens on assets;
- pay dividends and make contributions or repurchase our capital stock; and
- engage in certain transactions with affiliates.

The Loan Agreement, as recently amended in June 2022, also contains financial covenants. Beginning June 1, 2022 and prior to receiving potential regulatory approval for imetelstat, if any, we are required to maintain a minimum cash balance in an amount equal to the greater of: 50% of the outstanding principal amount under the Loan Agreement or $30.0 million. Under the Loan Agreement, if we enter into certain licensing transactions, this cash covenant requirement would increase to $35.0 million. After the potential regulatory approval for imetelstat, if any, the minimum cash requirement may be satisfied through one of the following three options, as elected by us: (a) maintaining a cash balance in an amount not less than 40% of the outstanding principal amount under the Loan Agreement; (b) maintaining a cash balance in an amount not less than 25% of the outstanding principal amount under the Loan Agreement, if our market cap is or exceeds $750.0 million; or (c) maintaining six month net product revenues of at least 70% of net product revenues forecasted by us, should any potential regulatory approval for imetelstat be obtained. The breach of any of these restrictive covenants or any other terms of the Loan Agreement would accelerate our obligation to repay our indebtedness under the Loan Agreement, which could have a material adverse effect on our business, business prospects and financial position.

We may not have cash available in an amount sufficient to enable us to make interest or principal payments on our indebtedness when due.

Our ability to make scheduled payments on or to refinance our indebtedness depends on our future performance and ability to raise additional sources of cash, which is subject to economic, financial, competitive and other factors beyond our control. If we are unable to generate sufficient cash to service our debt, we may be required to adopt one or more alternatives, such as selling assets, restructuring our debt or obtaining additional equity capital on terms that may be onerous or highly dilutive. If we desire to refinance our indebtedness, our ability to do so will depend on the state of the capital and lending markets and our financial condition at such time. We may not be able to engage in any of these activities or engage in these activities on desirable terms, which could result in a default on our debt obligations.

Failure to satisfy our current and future debt obligations under the Loan Agreement could result in an event of default. In addition, the Loan Agreement includes customary affirmative and negative covenants and other events of default, the occurrence and continuance of which provide Hercules and SVB (or its successor, if any) with the right to demand immediate repayment of all principal and unpaid interest under the Loan Agreement, and to exercise remedies against us and the collateral securing the Loan Agreement. These events of default include, among other things:

- insolvency, liquidation, bankruptcy or similar events;
- failure to observe any covenant or secured obligation under the Loan Agreement, which failure, in most cases, is not cured within 15 days;
- occurrence of an event that could reasonably be expected to have a material adverse effect on our business, operations, properties, assets or financial condition;
- material misrepresentations;
- occurrence of any default under any other agreement involving indebtedness in excess of specified amounts, or the occurrence of a default under any agreement that could reasonably be expected to have a material adverse effect on us; and
- certain money judgments being entered against us or any portion of our assets are attached or seized.

In the event of default, Hercules and SVB (or its successor, if any) could accelerate all of the amounts due under the Loan Agreement. Under such circumstances, we may not have enough available cash or be able to raise additional funds through equity or debt financings to repay such indebtedness at the time of such acceleration. In that case, we may be required to delay, limit, reduce or terminate imetelstat development or potential commercialization efforts or grant to others rights to develop and market imetelstat. Hercules and SVB (or its successor, if any) could also exercise their rights to take possession and dispose of the collateral securing the Loan Agreement, which collateral includes substantially all of our property other than intellectual property. Our business, financial condition and results of operations could be materially adversely affected as a result of any of these events.

RISKS RELATED TO PROTECTING OUR INTELLECTUAL PROPERTY

If we are unable to obtain and maintain sufficient intellectual property protection for imetelstat for an adequate amount of time, or if the scope of the intellectual property protection is not sufficiently broad, our competitors could develop and commercialize products similar or identical to imetelstat, and our ability to successfully commercialize imetelstat may be adversely affected.

Protection of our proprietary technology is critically important to our business. Our success and the success of our planned future development and commercialization of imetelstat will depend on our ability to protect our technologies and imetelstat through patents and other intellectual property rights. Our success will depend in part on our ability to obtain, maintain, enforce, and extend our patents and maintain trade secrets, both in the U.S. and in other countries.

The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our patents may be challenged in the courts or patent offices in the U.S. and in other countries. Such challenges may result in loss of exclusivity or in patent claims being narrowed, invalidated, or held unenforceable, which could limit our ability to stop others from using or commercializing imetelstat or our technology and/or limit the duration of the patent protection for imetelstat and our technology. In the event that we are unsuccessful in obtaining, maintaining, enforcing and extending our patents and other intellectual property rights or having our licensors maintain the intellectual property rights we have licensed, the value of imetelstat and/or our technologies will be adversely affected, and we may not be able to further develop or potentially commercialize imetelstat.

While we have method-of-use patents that protect the use of imetelstat for the treatment of certain diseases, this type of patent does not prevent a generic competitor from making and marketing a product that is identical to imetelstat for an indication that is outside the scope of our approved use after our composition of matter patents or their patent term extensions have expired. Moreover, even if competitors do not actively promote their product for our approved indications, physicians may prescribe or use these generic products “off-label,” which would result in decreased sales for us.

Loss or impairment of our intellectual property rights related to imetelstat might further delay or halt ongoing or potential future clinical trials of imetelstat and any applications for regulatory approval, and therefore might further delay or preclude any future development or commercialization of imetelstat by us. Furthermore, if imetelstat

is approved for commercial sale, such loss of intellectual property rights could impair our ability to exclude others from commercializing products similar or identical to imetelstat and therefore result in decreased sales for us. Occurrence of any of these events would materially and adversely affect our financial results, business and business prospects, and the future of imetelstat, and might cause us to cease operations.

Obtaining and maintaining our patent rights depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for noncompliance with these requirements.

The U.S. Patent and Trademark Office, or the Patent Office, and various governmental patent agencies in other countries require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. In addition, periodic maintenance fees, renewal fees, annuity fees and various other government fees on patents and/or patent applications will have to be paid to the Patent Office and various governmental patent agencies in other countries over the lifetime of our owned and licensed patents and/or patent applications and any patent rights we may own or license in the future. Maintaining such compliance may be impacted by the COVID-19 pandemic and the military conflict between Ukraine and Russia. Noncompliance events that could result in abandonment or lapse of a patent or patent application include, but are not limited to, failure to respond to official actions within prescribed time limits, nonpayment of fees and failure to properly legalize and submit formal documents. In many cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. There are situations, however, in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. For example, we have issued patents and pending patent applications in Ukraine and Russia, and if we are unable to submit responses to governmental patent agencies or make payments related to such patents and patent applications in a timely manner due to the military conflict in the region, these patents or patent applications may be irrevocably lost. In such an event, potential competitors might be able to enter the market with imetelstat or similar products, and this circumstance could harm our financial condition, business and business prospects and the future of imetelstat. In addition, if we are responsible for patent prosecution and maintenance of patent rights in-licensed to us or jointly owned with us, any of the foregoing could expose us to liability to the applicable patent owner or patent co-owner.

Patent terms may be inadequate to protect our competitive position on imetelstat for an adequate amount of time.

Patents have a limited lifespan. In the U.S., the natural expiration of a patent is generally 20 years after its first effective nonprovisional filing date. Given the amount of time required for the development, testing and regulatory review of imetelstat, patents protecting imetelstat (e.g., patents claiming imetelstat and/or components thereof, methods of use, or methods of making) might expire before imetelstat is commercialized. As a result, our intellectual property may not provide us with sufficient rights to exclude others from commercializing products similar or identical to imetelstat.

In the U.S., the Hatch-Waxman Act permits one patent per approved product to receive a patent term extension of up to five years beyond its normal expiration. The length of the patent term extension is typically calculated as one half of the clinical trial period plus the entire period of time during the review of the NDA by the FDA, minus any time of delay by us during these periods. There is also a limit on the patent term extension to a term that is no greater than fourteen years from drug approval. One of our owned or licensed U.S. patents may be eligible for patent term extension under the Hatch-Waxman Act.

Similar extensions are also available in certain countries and territories outside the U.S., such as in Japan, and in Europe as Supplementary Protection Certificates, or SPCs. If we select and are granted a patent term extension on a recently filed and issued patent, we may not receive the full benefit of a possible patent term extension, if at all. We might also not be granted a patent term extension at all, because of, for example, failure to apply within the applicable period, failure to apply prior to the expiration of relevant patents or otherwise failure to satisfy any of the numerous applicable requirements. Moreover, the applicable authorities, including the FDA and the Patent Office in the U.S., and any equivalent regulatory authorities in other countries, may not agree with our assessment of whether such extensions are available, may refuse to grant extensions to our patents, or may grant more limited extensions than we request. If we fail to apply for applicable patent term extensions or adjustments, we will have a more limited time during which we can enforce our granted patent rights. Should we seek a patent term extension, we may not be granted any such patent term extension and/or the applicable time period of such patent term extension could be less than five years. Moreover, in some countries, including the U.S., the scope of protection for claims under such patent term extensions, if any, does not extend to the full scope of the claims but is limited to the product composition as approved and, for a method of treatment patent, is limited to the approved indication. Thus, for example, if we do not receive a patent term extension for our U.S. composition of matter patent for imetelstat, as approved by the regulatory authorities, our U.S. composition of matter patent will expire in December 2025. If we

do not have sufficient patent life to protect imetelstat, our financial results, business and business prospects, and the future of imetelstat would be materially and adversely affected, which might cause us to cease operations.

If regulatory approval of imetelstat occurs after a patent has expired in a country that does not allow interim patent term extensions, as is the case in many countries and territories including Europe, we will be unable to obtain any patent term extension of that expired patent, and the duration of our patent rights may be limited. If we do not receive marketing approval and submit a request for an SPC before our patents expire in the European Economic Area, or EEA, where we have imetelstat composition of matter patents, our imetelstat composition of matter patents will expire in September 2024. In all other countries outside the U.S. and the EEA where we have imetelstat composition of matter patents, either: (a) extension of patent term is not available, and the patents will expire in September 2024, or (b) we may not have marketing authorization in those countries in sufficient time to file an extension of patent term before our composition of matter patents expire in September 2024. If we do not have sufficient patent life to protect imetelstat, our financial results, business and business prospects, and the future of imetelstat would be materially and adversely affected, which might cause us to cease operations.

Also, there are regulations for the listing of patents in the Approved Drug Products with Therapeutic Equivalence Evaluations, or the Orange Book. If we submit a patent for listing in the Orange Book, the FDA may decline to list the patent, or a manufacturer of generic drugs may challenge the listing. If imetelstat is approved and an appropriate patent covering imetelstat is not listed in the Orange Book or is subsequently removed from the Orange Book, a manufacturer of generic drugs would not be required to provide advance notice to us of any abbreviated NDA filed with the FDA to obtain permission to sell a generic version of imetelstat. Any of the foregoing could harm our competitive position, business, financial condition, results of operations and prospects.

Changes in U.S. or international patent law or interpretations of such patent laws could diminish the value of our patents in general, thereby impairing our ability to protect our technologies and imetelstat.

The patent positions of pharmaceutical and biopharmaceutical companies, including ours, are highly uncertain and involve complex legal and technical questions. In particular, legal principles for biotechnology and pharmaceutical patents in the U.S. and in other countries are evolving, and the extent to which we will be able to obtain patent coverage to protect our technologies and imetelstat, or enforce or defend issued patents, is uncertain.

The U.S. has enacted and implemented wide-ranging patent reform legislation, including the Leahy-Smith America Invents Act, or the AIA, signed into law on September 16, 2011. The U.S. Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening the rights of patent owners in certain situations. Depending on actions by Congress, the federal courts, and the Patent Office, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents or patents that we might obtain in the future. Similarly, changes in patent law and regulations in other countries or jurisdictions or changes in the governmental bodies that enforce them or changes in how the relevant governmental authority enforces patent laws or regulations may weaken our ability to obtain new patents or to enforce our existing patents or patents that we may obtain in the future. Occurrence of these events and/or significant impairment of our imetelstat patent rights would severely and adversely affect our financial results, business and business prospects, and the future of imetelstat, which might cause us to cease operations.

As a result of the AIA, in March 2013, the U.S. transitioned to a first-inventor-to-file system under which, assuming the other requirements for patentability are met, the first inventor to file a patent application is entitled to the patent. However, since the publication of discoveries in scientific or patent literature tends to lag behind actual discoveries by at least several months and sometimes several years, we are not able to be certain upon filing that the persons or entities that we name as inventors or applicants in our patent applications were the first to invent the inventions disclosed therein, or the first to file patent applications for these inventions. Thus, our ability to protect our patentable intellectual property depends, in part, on our ability to be the first to file patent applications with respect to our inventions, or inventions that were developed by our former collaboration partner and assigned to us, for the future development, commercialization and manufacture of imetelstat. As a result, if we are not the first-inventor-to-file, we may not be able to obtain patents for discoveries that we otherwise would consider patentable and that we consider to be significant to the future success of imetelstat. Delay in the filing of a patent application for any purpose, including further development or refinement of an invention, may result in the risk of loss of patent rights.

Following the result of a referendum in 2016, the U.K. left the EU on January 31, 2020, commonly referred to as Brexit. The impact of the withdrawal of the U.K. from the EU will not be known for some time, which could lead to a period of uncertainty relating to our ability to obtain and maintain SPCs of imetelstat based on our U.K. patents and our ability to establish and maintain European trademarks in the U.K. In 2012, the European Patent Package, or

EU Patent Package, regulations were passed with the goal of providing for a single pan-European Unitary Patent, and a new European Unified Patent Court, or UPC, for litigation of European patents. The EU Patent Package was ratified in February 2023 and currently covers 17 EU states. On June 1, 2023, all European patents, including those issued prior to ratification, will by default automatically fall under the jurisdiction of the UPC and allow for the possibility of obtaining pan-European injunctions and also be at risk of central revocation at the UPC in participating UPC states. Under the EU Patent Package, patent holders are permitted to "opt out" of the UPC on a patent-by-patent basis during an initial seven year period after the EU Patent Package is ratified. Owners of European patent applications who receive notice of grant after the EU Patent Package is ratified could, for the UPC contracting states, either obtain a Unitary Patent or validate the patent nationally and file an opt-out demand. The EU Patent Package may increase the uncertainties and costs surrounding the enforcement or defense of our issued European patents and pending applications. The full impact on future European patent filing strategy and the enforcement or defense of our issued European patents in member states and/or the UPC is not known.

Challenges to our owned or licensed patent rights would result in costly and time-consuming legal proceedings that could prevent or limit development of imetelstat.

Our patents or those patent rights we have licensed, including patent rights that we may seek with respect to inventions made by past or future collaborators, may be challenged through administrative or judicial proceedings, which could result in the loss of important patent rights. For example, where more than one party seeks U.S. patent protection for the same technology in patent applications that are subject to the law before the implementation of the AIA, the Patent Office may declare an interference proceeding in order to ascertain the party to which the patent should be issued. Patent interferences are typically complex, highly contested legal proceedings, subject to appeal. They are usually expensive and prolonged and can cause significant delay in the issuance of patents. Our pending patent applications or our issued patents, or those we have licensed and may license from others, may be drawn into interference proceedings or be challenged through post-grant review procedures or litigation, any of which could delay or prevent the issuance of patents, or result in the loss of issued patent rights. We may not be able to obtain from our past or future collaborators the information needed to support our patent rights which could result in the loss of important patent rights.

Under the AIA, interference proceedings between patent applications filed on or after March 16, 2013, have been replaced with other types of proceedings, including derivation proceedings. The AIA also includes post-grant review procedures subjecting U.S. patents to post-grant review procedures similar to European oppositions, such as *inter partes* review, or IPR, covered business method post-grant reviews and other post-grant reviews. This applies to all of our U.S. patents and those we have licensed and may license from others, even those issued before March 16, 2013. Because of a lower evidentiary standard necessary to invalidate a patent claim in Patent Office proceedings compared to the evidentiary standard in U.S. federal court, a third-party could potentially provide evidence in a Patent Office proceeding sufficient for the Patent Office to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a district court action. Accordingly, a third-party could attempt to use the Patent Office procedures to invalidate patent claims that would not have been invalidated if first challenged by the third-party as a defendant in a district court action. U.S. patents owned or licensed by us may therefore be subject to post-grant review procedures, as well as other forms of review and re-examination. In addition, the IPR process under the AIA permits any person, whether they are accused of infringing the patent at issue or not, to challenge the validity of certain patents. As a result, entities associated with hedge funds have challenged valuable pharmaceutical patents through the IPR process. Significant impairment of our imetelstat patent rights would severely and adversely affect our financial results, business and business prospects, and the future of imetelstat, which might cause us to cease operations.

Certain jurisdictions, such as Europe, New Zealand and Australia, permit oppositions to be filed against granted patents or patents proposed to be granted. Because we seek to enable potential global commercialization of imetelstat, securing both proprietary protection and freedom to operate outside of the U.S. is important to our business. Opposition proceedings require significant time and costs, and if we are unsuccessful or are unable to commit these types of resources to protect our imetelstat patent rights, we could lose our patent rights and we could be prevented or limited in the development and commercialization of imetelstat.

As more groups become engaged in scientific research and product development in the areas of telomerase biology and hematologic malignancies, the risk of our patents, or patents that we have in-licensed, being challenged through patent interferences, derivation proceedings, IPRs, post-grant proceedings, oppositions, re-examinations, litigation or other means will likely increase. For example, litigation may arise as a result of our decision to enforce our patent rights against third parties. Challenges to our patents through these procedures would be extremely expensive and time-consuming, even if the outcome was favorable to us. An adverse outcome in a patent dispute could severely harm our ability to further develop or commercialize imetelstat, or could otherwise have a material adverse effect on our business, and might cause us to cease operations, by:

- causing us to lose patent rights in the relevant jurisdiction(s);
- subjecting us to litigation, or otherwise preventing us from commercializing imetelstat in the relevant jurisdiction(s);
- requiring us to obtain licenses to the disputed patents;
- forcing us to cease using the disputed technology; or
- requiring us to develop or obtain alternative technologies.

We may not be able to protect our intellectual property rights throughout the world.

Filing, prosecuting, maintaining, defending and enforcing patents for imetelstat and our technologies in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the U.S. are less extensive than those in the U.S. The requirements for patentability may differ in certain countries, particularly in developing countries; thus, even in countries where we do pursue patent protection, there can be no assurance that any patents will issue with claims that cover imetelstat and our technologies. There can be no assurance that we will obtain or maintain patent rights inside or outside the U.S. under any future license agreements. In addition, the laws of some countries outside the U.S. do not protect intellectual property rights to the same extent as federal and state laws in the U.S. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the U.S., even in jurisdictions where we pursue patent protection, or from selling or importing products made using our inventions in and into the U.S. or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not pursued and obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where we have patent protection, but enforcement is not as strong as that in the U.S. These products may compete with imetelstat and our technologies and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in jurisdictions outside the U.S. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets and other intellectual property protection, particularly those relating to biotechnology and pharmaceutical products, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights generally. For example, many countries outside the U.S. have compulsory licensing laws under which a patent owner must grant licenses to third parties. Proceedings to enforce our patent rights, even if obtained, in jurisdictions outside the U.S. could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful. While we intend to protect our intellectual property rights in major markets for imetelstat, we cannot ensure that we will be able to initiate or maintain similar efforts in all jurisdictions in which we may wish to market imetelstat. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we own and potentially develop in the future.

We may be subject to infringement claims that are costly to defend, and such claims may limit our ability to use disputed technologies and prevent us from pursuing research, development, manufacturing or commercialization of imetelstat.

The commercial success of imetelstat will depend upon our ability to research, develop, manufacture, market and sell imetelstat without infringing or otherwise violating the intellectual property and other proprietary rights of third parties. There is considerable intellectual property litigation in the biotechnology and pharmaceutical industries, and many pharmaceutical companies, including potential competitors, have substantial patent portfolios. Since we cannot be aware of all intellectual property rights potentially relating to imetelstat and its uses, we do not know with certainty that imetelstat, or the intended commercialization thereof, does not and will not infringe or otherwise violate any third-party's intellectual property. For example, we are aware that certain third parties have or may be prosecuting patents and patent estates that may relate to imetelstat, and while we believe these patents will expire before imetelstat is able to be commercialized and/or that these patents are invalid and/or would not be infringed by the manufacture, use or sale of imetelstat, it is possible that the owner(s) of these patents will assert claims against us in the future.

In the event our technologies infringe the rights of others or require the use of discoveries and technologies controlled by third parties, we may be prevented from pursuing research, development, manufacturing or commercialization of imetelstat, or may be required to obtain unblocking licenses from such third parties, develop alternative non-infringing technologies, which we may not be able to do at an acceptable cost or on acceptable terms, or at all, or cease the development of imetelstat. If we are unable to resolve an infringement claim successfully, we could be subject to an injunction that would prevent us from potentially commercializing imetelstat and could also require us to pay substantial damages. In addition, while our past collaboration agreements have terminated, we are still subject to indemnification obligations to certain collaborators, including with respect to claims of third-party patent infringement.

In addition to infringement claims, in the future we may also be subject to other claims relating to intellectual property, such as claims that we have misappropriated the trade secrets of third parties. Provided that we are successful in continuing the development of imetelstat, we expect to see more efforts by others to obtain patents that are positioned to cover imetelstat. Our success therefore depends significantly on our ability to operate without infringing patents and the proprietary rights of others.

We may become aware of discoveries and technologies controlled by third parties that are advantageous or necessary to further develop or manufacture imetelstat. Under such circumstances, we may initiate negotiations for licenses to other technologies as the need or opportunity arises. We may not be able to obtain a license to a technology required to pursue the research, development, manufacture or commercialization of imetelstat on commercially favorable terms, or at all, or such licenses may be terminated on certain grounds, including as a result of our failure to comply with any material obligations under such licenses. If we do not obtain a necessary license or if such a license is terminated, we may need to redesign such technologies or obtain rights to alternative technologies, which may not be possible, and even if possible, could cause further delays in the development efforts for imetelstat and could increase the development and/or production costs of imetelstat. In cases where we are unable to license necessary technologies, we could be subject to litigation and prevented from pursuing research, development, manufacturing or commercialization of imetelstat, which would materially and adversely impact our business. Failure by us to obtain rights to alternative technologies or a license to any technology that may be required to pursue research, development, manufacturing or commercialization of imetelstat would further delay current and potential future clinical trials of imetelstat and any applications for regulatory approval, impair our ability to sell imetelstat, if approved, and therefore result in decreased sales of imetelstat for us. Occurrence of any of these events would materially and adversely affect our business, and might cause us to cease operations.

We are seeking registered trademarks for a commercial trade name for imetelstat in the U.S. and jurisdictions outside of the U.S. and failure to secure such registrations could adversely affect our business.

We are seeking registration of trademarks for a potential commercial trade name for imetelstat in the U.S. and other jurisdictions outside of the U.S. During trademark registration proceedings, we may receive rejections. Although we are given an opportunity to respond to those rejections, we may be unable to overcome such rejections. In addition, in the U.S. Patent and Trademark Office and in comparable agencies in many jurisdictions outside of the U.S., third parties are given an opportunity to oppose pending trademark applications and to seek to cancel registered trademarks. Opposition or cancellation proceedings may be filed against our trademarks, and our trademarks may not survive such proceedings. Moreover, any name we propose to use for imetelstat in the U.S. and Europe must be approved by the FDA and the EMA respectively, regardless of whether we have registered it, or applied to register it, as a trademark. Both the FDA and the EMA typically conduct a review of proposed product names, including an evaluation of potential for confusion with other product names. If the FDA or the EMA rejects all of our proposed proprietary product names, we may be required to expend additional time and resources in an effort to identify a suitable substitute name that would qualify under applicable trademark laws, not infringe the existing rights of third parties and be acceptable to the FDA and the EMA.

We may become involved in disputes with past or future collaborator(s) over intellectual property inventorship, ownership or use, and publications by us, or by investigators, scientific consultants, research collaborators or others. Such disputes could impair our ability to obtain patent protection or protect our proprietary information, which, in either case, could have a significant impact on our business.

Inventions discovered under research, material transfer or other collaboration agreements may become jointly owned by us and the other party to such agreements in some cases, and may be the exclusive property of either party in other cases. Under some circumstances, it may be difficult to determine who invents and owns a particular invention, or whether it is jointly owned, and disputes can arise regarding inventorship, ownership and use of those inventions. These disputes could be costly and time-consuming, and an unfavorable outcome could have a significant adverse effect on our business if we are not able to protect or license rights to these inventions. In addition, clinical trial investigators, scientific consultants and research collaborators generally have contractual

rights to publish data and other proprietary information, subject to review by the trial sponsor. Publications by us, or by investigators, scientific consultants, previous employees, research collaborators or others, either with permission or in contravention of the terms of their agreements with us or with our past or future collaborators, may impair our ability to obtain patent protection or protect proprietary information which would have a material adverse effect on our business, and might cause us to cease operations.

Much of the information and know-how that is critical to our business is not patentable, and we may not be able to prevent others from obtaining this information and establishing competitive enterprises.

We rely on trade secrets to protect our proprietary technology, especially in circumstances in which we believe patent protection is not appropriate or available. We attempt to protect our proprietary technology in part by confidentiality agreements with our employees, consultants, collaborators and contractors. However, we cannot provide assurance that these agreements will not be breached, that we would have adequate remedies for any breach, or that our trade secrets will not otherwise become known or be independently discovered by competitors, any of which would harm our business significantly.

In May 2016, the Defend Trade Secrets Act of 2016, or the DTSA, was enacted, providing a federal cause of action for misappropriation of trade secrets. Under the DTSA, an employer may not collect enhanced damages or attorney fees from an employee or contractor in a trade secret dispute brought under the DTSA, unless certain advanced provisions are observed. We cannot provide assurance that our existing agreements with employees and contractors contain notice provisions that would enable us to seek enhanced damages or attorneys' fees in the event of any dispute for misappropriation of trade secrets brought under the DTSA.

RISKS RELATED TO MANAGING OUR GROWTH AND OTHER BUSINESS OPERATIONS

We may be unable to successfully retain or recruit key personnel to support the development and potential future commercialization of imetelstat or to otherwise successfully manage our growth.

Our ability to successfully develop imetelstat in the future and to potentially commercialize imetelstat depends to a significant extent on the skills, experience and efforts of our executive officers and key members of our staff. In addition, we need to recruit, maintain, motivate and integrate additional personnel with expertise and experience in clinical science, biostatistics, clinical operations, pharmacovigilance, quality, manufacturing, regulatory affairs, medical affairs, legal affairs, market access, pricing, commercial operations, sales, and marketing, to enable us to further develop and potentially commercialize imetelstat.

We face intense competition for qualified individuals from numerous pharmaceutical, biopharmaceutical and biotechnology companies, as well as academic and other research institutions, and competition in our geographic regions is particularly intense. The substantial risks and uncertainties related to our development and potential commercialization of imetelstat and the risks and uncertainties regarding our future business viability could have an adverse impact on our ability to retain and recruit qualified personnel. We may also face higher than expected personnel costs in order to attract new personnel due to shortages in qualified applicants, or to maintain our current management and personnel due to the increased number of opportunities in the biotechnology sector. If we are unable to successfully retain, motivate and incentivize our existing personnel, or to attract, assimilate and retain other highly qualified personnel in the future on acceptable terms, our ability to further develop and potentially commercialize imetelstat will be impaired, and our business and the price of our common stock would be adversely impacted.

In addition, our personnel are currently performing their duties in multiple jurisdictions, and if we are unable or fail to comply with employment, tax, benefits and other laws in such jurisdictions, we may face penalties, fines or litigation. Further, if members of our management and other key personnel in critical functions across our organization are unable to perform their duties or have limited availability due to the effects of the COVID-19 pandemic, we may not be able to execute on our business strategy and/or our operations may be negatively impacted.

Our future financial performance and our ability to develop, manufacture and commercialize imetelstat will depend, in part, on our ability to effectively manage any future growth. Our management may have to divert financial and other resources, as well as devote a substantial amount of time, to managing growth activities, such as enhancing operational, financial and management processes and systems. If we do not effectively manage the expansion of our operations, we could experience weaknesses in our infrastructure and ability to comply with applicable legal and regulatory requirements and regulations, operational mistakes or shortcomings, loss of business opportunities, loss of employees and reduced productivity among remaining employees. The expansion of our operations also could lead to significant costs and could delay the execution of our business plans or disrupt our

current operations. Our ineffective performance in managing any such future growth would negatively impact our business prospects.

As our operations continue to expand, we expect that we will need to manage new and additional relationships with various service providers, vendors, suppliers and other third parties, as well as a workforce in multiple countries, jurisdictions and locations. For example, in September 2021, we established a subsidiary in the U.K. to accommodate our growing workforce in that location. Our business needs and the expansion of our workforce may require us to establish additional business offices or entities in additional jurisdictions outside of the U.S., including additional subsidiaries, or to retain third parties to manage employment-related matters in new countries, jurisdictions and locations. Because the legal and regulatory requirements related to the operation and maintenance of such entities, and the employment of personnel in such countries, jurisdictions and regions is multi-national and complex, we may be unable to effectively operate and maintain such entities, or be unable to attract and retain ex-U.S. personnel, which could lead to significant costs and could delay the execution of our business plans or disrupt our current and future operations. If we fail to achieve key development goals, our abilities to grow as a company, and to further develop and potentially commercialize imetelstat, could be prevented or hindered, and our business and business prospects would be severely harmed, which might cause us to cease operations.

Notwithstanding our research and discovery efforts, we expect imetelstat to remain our sole product candidate for the foreseeable future. If we are unable to successfully develop and commercialize imetelstat, our business and business prospects would be severely harmed, which might cause us to cease operations.

Other than imetelstat, we do not currently have any other product candidates. While we recently initiated a discovery program to identify a lead compound as a potential next generation oral telomerase inhibitor, our discovery efforts are at an early stage and may not be successful. In this regard, internal discovery efforts to identify new product candidates require substantial technical, financial and human resources, and the outcome of those efforts are uncertain and unpredictable. In addition, these discovery efforts may initially show promise in identifying a potential product candidate, yet fail to yield a product candidate for clinical development for a number of reasons, including where the research methodology used may not be successful in identifying a potential product candidate, or where a potential product candidate may, on further study, be shown to have inadequate efficacy, harmful side effects, suboptimal pharmaceutical profile or other characteristics suggesting that it is unlikely to be an effective product. Furthermore, in addition to research and development risks, any potential lead compounds identified during discovery may not be patentable, and therefore unsuitable for further development. Likewise, our research efforts to evaluate imetelstat in lymphoid hematologic malignancies may not be successful. In any event, notwithstanding our research and discovery efforts, we remain and expect to continue remain wholly reliant upon the development of imetelstat, our sole product candidate, for the foreseeable future. If we are unable to successfully develop and commercialize imetelstat, our business and business prospects would be severely harmed, which might cause us to cease operations. Similarly, if we are unable to discover and develop new product candidates or to develop imetelstat in lymphoid hematologic malignancies through our research and discovery efforts, our business and business prospects would be harmed.

If we seek to establish potential future collaborative arrangements for imetelstat, we may be unable to establish such collaborative arrangements on acceptable terms, or at all, and may have to delay, alter or abandon our imetelstat development and commercialization plans.

We intend to develop imetelstat broadly for hematologic malignancies, and to potentially commercialize, market and sell imetelstat in the U.S. We may seek a collaborative partner or partners, at an appropriate time, to assist us in the potential development and commercialization of imetelstat, especially outside the U.S., and to provide funding for such activities. We face significant competition in seeking appropriate collaborative partners, and these potential collaborative arrangements are complex and time consuming to negotiate, document and implement. Our ability to seek and establish potential collaborative arrangements may be impacted by the effects of the COVID-19 pandemic on our clinical trial activities and the resulting delays in reporting any results from IMpactMF, as well as the period of the patent term for our intellectual property portfolio and market exclusivity for imetelstat. We may not be able to establish collaborative arrangements on acceptable terms, or at all. In this regard, collaborative arrangements with third parties may require us to relinquish material rights, including revenue from potential commercialization, or assume material ongoing development obligations that we would have to fund or otherwise support.

In any event, we are unable to predict when, if ever, we will enter into any collaborative arrangements because of the numerous risks and uncertainties associated with establishing collaborative arrangements. Moreover, given the significant risks and uncertainties regarding the future imetelstat development program, potential collaborative partners may be reluctant to enter into new collaborative arrangements with us, or may only be willing to do so on

terms that are not favorable to us. As a result, we may not be successful in finding a collaborative partner or partners on favorable terms, if at all. If we are unable to negotiate collaborative arrangements, we may have to:

- delay or curtail the additional development of imetelstat;
- further delay or abandon the potential commercialization of imetelstat outside of the U.S.;
- reduce the scope of potential future sales or marketing activities; or
- increase our expenditures and undertake development or commercialization activities at our own expense, which will require additional capital than our current resources.

In the absence of future proceeds from potential cash exercises of currently outstanding warrants and potential drawdowns under the Loan Agreement, we will require substantial additional funding to further advance the imetelstat program, including through the completion of IMpactMF, IMproveMF and the investigator-led trial IMpress, as well as conducting the clinical, regulatory and potential commercialization activities necessary to potentially bring imetelstat to market in relapsed/refractory MF and any other future indications, and our need for additional funds may arise sooner than planned. However, we cannot predict with any certainty whether and to what extent the outstanding warrants will be exercised for cash, or the timing or availability of additional funds under the Loan Agreement, if at all. In addition, if we elect to increase our expenditures to fund imetelstat development or commercialization activities outside the U.S., we will be required to substantially increase our personnel resources and we will need to obtain substantial further capital, which may not be available to us on acceptable terms, or at all. If we are unable to raise additional capital if and when needed, we will not be able to further advance the imetelstat program, including through the completion of IMpactMF, IMproveMF and the investigator-led trial IMpress, as well as to conduct the clinical, regulatory and potential commercialization activities necessary to potentially bring imetelstat to market in relapsed/refractory MF and any other future indications to generate product revenues. Establishing the infrastructure necessary to further develop, commercialize, market and sell imetelstat worldwide will require substantial resources and may divert the attention of our management and key personnel and negatively impact our imetelstat development or commercialization efforts in the U.S.

We currently have no products approved for commercial sale, and we have not yet demonstrated an ability to obtain marketing approvals for any product candidates, which makes it difficult to assess our future viability.

We have never derived any revenue from the sales of any products. Our operations to date have been limited to organizing and staffing our company, acquiring, developing and securing our technology, undertaking non-clinical studies and clinical trials of imetelstat and past product candidates that we have subsequently discontinued, and engaging in research and development under collaboration agreements. We have not yet demonstrated an ability to obtain regulatory approvals for commercialization activities, formulate and manufacture commercial-scale products, or conduct sales and marketing activities necessary for successful product commercialization. Consequently, for these and other reasons discussed elsewhere in these risk factors, it is difficult to predict our future success and the viability of our business and the imetelstat program.

We have business operations in the United Kingdom which exposes us to additional costs and risks.

Our business operations in the U.K. subject us to certain additional costs and risks associated with doing business outside the U.S., including:

- the increased complexity and costs inherent in managing international operations in geographically disparate locations;
- challenges of complying with diverse regulatory, financial and legal requirements, which are subject to change at any time;
- potentially adverse tax consequences, including changes in applicable tax laws and regulations;
- potentially costly trade laws, tariffs, export quotas, custom duties or other trade restrictions, and any changes to them;
- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- liabilities for activities of, or related to, our international operations;
- challenges inherent in efficiently managing employees in diverse geographies, including the need to adapt systems, policies, benefits and compliance programs to differing labor and other regulations;

- natural disasters, political and economic instability, including terrorism and civil and political unrest, outbreak of health epidemics, including the evolving COVID-19 pandemic, and the resulting global economic and social impacts;
- workforce uncertainty in countries where labor unrest is more common than in the U.S.; and
- compliance with the United Kingdom Bribery Act 2010, or UK Bribery Act, and similar antibribery and anticorruption laws in other jurisdictions, and the Foreign Corrupt Practices Act, including its books and records provisions and its anti-bribery provisions, including by failing to maintain accurate information and control over sales and distributors' activities.

In addition, our international operations in the U.K. expose us to fluctuations in currency exchange rates between the British pound and the U.S. dollar. Given the volatility of currency exchange rates, there is no assurance that we will be able to effectively manage currency transaction and/or conversion risks. To date, we have not entered into derivative instruments to offset the impact of foreign exchange fluctuations, which fluctuations could have an adverse effect on our financial condition and results of operations.

We may not be able to obtain or maintain sufficient insurance on commercially reasonable terms or with adequate coverage against potential liabilities in order to protect ourselves against product liability claims or claims related to clinical trial conduct, or claims related to data protection.

Our business exposes us to potential product liability and other risks that are inherent in the testing, manufacturing and marketing of human therapeutic and diagnostic products. We may become subject to product liability claims or claims related to clinical trial conduct, including if the use of imetelstat is alleged to have injured patients, such as injuries alleged to arise from any hepatotoxicity or hemorrhagic event associated with the use of imetelstat. We currently have limited clinical trial liability insurance, and we may not be able to maintain this type of insurance for any of our current or potential future clinical trials of imetelstat. In addition, this type of insurance may become too expensive for us to afford because of the highly risky and uncertain nature of clinical trials generally and the high cost of insurance for our business activities. We may be unable to obtain or maintain clinical trial insurance in all of the jurisdictions where we conduct current or potential future clinical trials. In addition, business liability, product liability and cybersecurity insurance are becoming increasingly expensive, particularly for biotechnology and pharmaceutical companies, and the pool of insurers offering insurance coverage to biotechnology and pharmaceutical companies generally is becoming smaller, making it more difficult to obtain insurance for our business activities at a reasonable price, or at all. Being unable to obtain or maintain product liability, clinical trial liability, cybersecurity or other insurance for our business activities in the future on acceptable terms or with adequate coverage against potential liabilities would have a material adverse effect on our business, and could cause us to cease our development of imetelstat.

We and certain of our officers have been named as defendants in pending securities class action lawsuits and shareholder derivative lawsuits. These lawsuits, and potential similar or related lawsuits, could result in substantial damages, divert management's time and attention from our business, and have a material adverse effect on our results of operations. These lawsuits, and any other lawsuits to which we are subject, will be costly to defend or pursue and are uncertain in their outcome.

Securities-related class action lawsuits and/or derivative lawsuits have often been brought against companies, including biotechnology and biopharmaceutical companies, that experience volatility in the market price of their securities. This risk is especially relevant for us because we often experience significant stock price volatility in connection with our product development activities.

Between January 23, 2020 and March 5, 2020, three securities class action lawsuits were filed against us and certain of our officers. One of the lawsuits was voluntarily dismissed on March 19, 2020. The other two lawsuits, filed in the U.S. District Court, or the Court, for the Northern District of California, or the Northern District, were consolidated by the Court on May 14, 2020, and on August 20, 2020, the lead plaintiffs filed a consolidated class action complaint. The consolidated class action complaint alleges violations of the Securities Exchange Act of 1934, as amended, or the Exchange Act, in connection with allegedly false and misleading statements made by us related to IMbark during the period from March 19, 2018, to September 26, 2018. The consolidated class action complaint alleges, among other things, that we violated Sections 10(b) and 20(a) of the Exchange Act and SEC Rule 10b-5 by failing to disclose facts related to the alleged failure of IMbark to meet the two primary endpoints of the trial, spleen response rate and Total Symptom Score, and that our stock price dropped when such information was disclosed. The plaintiffs in the consolidated class action complaint seek damages and interest, and an award of reasonable costs, including attorneys' fees. On October 22, 2020, lead plaintiffs filed an amended consolidated class action complaint. We filed a motion to dismiss the amended consolidated class action complaint on November 23, 2020. On April 12, 2021, the Court granted in part and denied in part our motion to dismiss. Our answer to the amended consolidated

class action complaint was filed on May 13, 2021. On September 30, 2021, lead plaintiffs filed their motion for class certification, and on April 2, 2022, the Court granted the lead plaintiffs' motion for class certification. On September 2, 2022, the parties agreed to a settlement and entered into a Stipulation and Agreement of Settlement, or the Stipulation, which is subject to court approval. On October 13, 2022, the Court preliminarily approved the parties' settlement, permitted notice to be distributed to the class members, and scheduled a final approval hearing for March 30, 2023. Final approval of the settlement is subject to a number of conditions and contingencies out of our control. There can be no guarantee that all of these conditions and contingencies will occur. Should a material condition or contingency to the settlement fail to occur, one or both of the parties to the settlement may exercise their right to terminate the settlement agreement.

Between April 23, 2020 and June 8, 2021, seven shareholder derivative actions were filed, naming as defendants certain of our current officers and certain current and former members of our board. Of these actions, or the Derivative Lawsuits, two were filed in the Northern District, two were filed in the Court of Chancery of the State of Delaware, two were filed in the U.S. District Court for the District of Delaware, and one was filed in the Superior Court of California for the County of San Mateo, respectively. The plaintiffs in the Derivative Lawsuits allege breach of fiduciary duty and/or violations of Section 14 of the Exchange Act, based on the same underlying facts as the consolidated class action lawsuit described above. The plaintiffs seek damages, corporate governance reforms, equitable relief, restitution, and an award of reasonable costs, including attorneys' fees. The status of the seven Derivative Lawsuits is currently as follows:

- On July 2, 2021, we filed a motion to dismiss the consolidated shareholder derivative actions filed in the Court of Chancery of the State of Delaware, or the Chancery Court Derivative Lawsuits. On September 1, 2021, the plaintiffs filed a consolidated amended complaint in the Chancery Court Derivative Lawsuits. On October 12, 2021, we filed our motion to dismiss the consolidated amended complaint. The Court of Chancery of the State of Delaware heard oral argument on the motion on February 15, 2022, and, on June 22, 2022, issued an order staying its decision on our motion to dismiss until after final resolution of the consolidated class action lawsuit described above. On December 21, 2022, the parties in the Chancery Court Derivative Lawsuits entered into a Stipulation of Settlement, or the Derivative Stipulation, that, subject to final approval by the Court of Chancery of the State of Delaware, will resolve the Chancery Court Derivative Lawsuits. A final approval hearing regarding the Derivative Stipulation has been scheduled for May 17, 2023. Final approval of the settlement is subject to a number of conditions and contingencies out of our control. There can be no guarantee that all of these conditions and contingencies will occur. Should a material condition or contingency to the settlement fail to occur, one or more of the parties to the settlement may exercise their right to terminate the settlement agreement;

- The consolidated shareholder derivative actions filed in the U.S. District Court for the District of Delaware have been stayed pending the ruling on our motion to dismiss the Chancery Court Derivative Lawsuits. On December 21, 2022, the parties in the consolidated District of Delaware derivative actions entered into the Derivative Stipulation, that, subject to final approval by the Court of Chancery of the State of Delaware, will resolve the consolidated District of Delaware derivative actions;

- The consolidated shareholder derivative actions filed in the Northern District were initially stayed through the ruling on our motion to dismiss in the consolidated class action lawsuit described above and then subsequently were stayed through the ruling on the lead plaintiffs' motion for class certification in the consolidated class action lawsuit. Subsequent to the grant of class certification in the consolidated class action lawsuit, on May 3, 2022, the Northern District entered an order providing plaintiffs until June 7, 2022, to file an amended complaint. On June 7, 2022, plaintiffs filed an amended shareholder derivative complaint. On July 6, 2022, the Northern District entered an order staying the consolidated shareholder derivative actions filed in the Northern District until the earlier of either a public announcement of a settlement in the consolidated class action lawsuit or a final, non-appealable judgment in the consolidated class action lawsuit. The stay has subsequently been extended on a number of occasions and the case is currently stayed through March 31, 2023. On December 21, 2022, the parties in the consolidated derivative actions in the Northern District entered into the Derivative Stipulation, that, subject to final approval by the Court of Chancery of the State of Delaware, will resolve the consolidated derivative actions in the Northern District; and

- Our motion to dismiss the shareholder derivative action pursuant to the forum selection clause in our amended and restated bylaws was filed in the Superior Court of California for the County of San Mateo on August 5, 2021. At the hearing on the motion to dismiss on November 2, 2021, the court granted our motion to dismiss and stayed the case until April 19, 2022. At the case management conference on April 19, 2022, the court continued the stay until June 14, 2022. At the case management conference on June 14, 2022, the court continued the stay until December 13, 2022. On December 13, 2022, the court dismissed the action without prejudice.

It is possible that additional lawsuits will be filed, or allegations received from stockholders, with respect to these same or other matters and also naming us and/or our officers and directors as defendants. Such lawsuits and any other related lawsuits are subject to inherent uncertainties, and the actual defense and disposition costs will depend upon many unknown factors. The outcome of such lawsuits is necessarily uncertain. We could be forced to expend significant resources in the defense of the pending lawsuits and any additional lawsuits, and we may not prevail. In addition, we have and may continue to incur substantial legal fees and costs in connection with such lawsuits. As discussed in Note 6 on Commitments and Contingencies in Notes to Consolidated Financial Statements of this annual report on Form 10-K for the year ended December 31, 2022, we recorded our portion of the settlement amounts for the Stipulation and the Derivative Stipulation on our consolidated statements of operations for the year ended December 31, 2022, as well as corresponding liabilities on our consolidated balance sheet as of December 31, 2022. We currently are not able to estimate the possible additional costs to us, if any, from these matters, and we cannot be certain how long it may take to resolve the pending lawsuits or the possible amount of any damages or legal costs that we may be required to pay. Monitoring, initiating and defending against legal actions is time-consuming for our management, is likely to be expensive and may detract from our ability to fully focus our internal resources on our business activities. We could be forced to expend significant resources in the settlement or defense of the pending lawsuits and any potential future lawsuits, and we may not prevail in such lawsuits. Additionally, we may not be successful in having any such lawsuits dismissed or settled within the limits of our insurance coverage.

We have not established any reserve for any potential liability relating to the pending lawsuits or any potential future lawsuits, other than for the total settlement amount under the Stipulation. It is possible that we could, in the future, incur judgments or enter into settlements of claims for monetary damages. A decision adverse to our interests in the pending lawsuits, or in similar or related litigation, could result in the payment of substantial damages, or possibly fines, and could have a material adverse effect on our business, our stock price, cash flow, results of operations and financial condition.

We may be subject to third-party litigation, and such litigation would be costly to defend or pursue and uncertain in its outcome.

Our business may bring us into conflict with our licensees, licensors, or others with whom we have contractual or other business relationships, or with our competitors or others whose interests differ from ours. We may experience employment-related disputes as we seek to expand our personnel resources. We may become involved in performance or other disputes with the CROs we have retained to support our imetelstat clinical development activities, or with other third parties such as service providers, vendors, manufacturers, suppliers or consultants, which could result in a further delay or cessation of current and potential future clinical trials and otherwise significantly further delay our ability to develop imetelstat. If we are unable to resolve those conflicts on terms that are satisfactory to all parties, we may become involved in litigation brought by or against us.

Lawsuits are subject to inherent uncertainties, and defense and disposition costs depend upon many unknown factors. Despite the availability of insurance, we may incur substantial legal fees and costs in connection with litigation. Lawsuits could result in judgments against us that require us to pay damages, enjoin us from certain activities, or otherwise negatively affect our legal or contractual rights, which could have a significant adverse effect on our business. In addition, the inherent uncertainty of such litigation could lead to increased volatility in our stock price and a decrease in the value of our stockholders' investment in our securities.

We are subject to U.S. and certain foreign export and import controls, sanctions, embargoes, anti-corruption laws, and anti-money laundering laws and regulations. Compliance with these legal standards could impair our ability to compete in domestic and international markets. We can face criminal liability and other serious consequences for violations, which can harm our business.

We are subject to export control and import laws and regulations, including the U.S. Export Administration Regulations, U.S. Customs regulations, various economic and trade sanctions regulations administered by the U.S. Treasury Department's Office of Foreign Assets Controls, the U.S. Foreign Corrupt Practices Act of 1977, as amended, or FCPA, the U.S. domestic bribery statute contained in 18 U.S.C. § 201, the U.S. Travel Act, the USA PATRIOT Act, and other state and national anti-bribery and anti-money laundering laws in the countries in which we conduct activities. Anti-corruption laws are interpreted broadly and prohibit companies and their employees, agents, contractors, and other collaborators from authorizing, promising, offering, or providing, directly or indirectly, improper payments or anything else of value to recipients in the public or private sector. We may engage third parties to sell our products outside the United States, to conduct clinical trials, and/or to obtain necessary permits, licenses, patent registrations, and other regulatory approvals. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities, and other organizations. We can be held liable for the corrupt or other illegal activities of our employees, agents, contractors,

and other collaborators, even if we do not explicitly authorize or have actual knowledge of such activities. Any violations of the laws and regulations described above may result in substantial civil and criminal fines and penalties, imprisonment, the loss of export or import privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm, and other consequences.

RISKS RELATED TO COMPETITIVE FACTORS

If competitors develop products, product candidates or technologies that are superior to or more cost-effective than imetelstat, this would significantly impact the development and commercial viability of imetelstat, which would severely and adversely affect our financial results, business and business prospects, and the future of imetelstat, and might cause us to cease operations.

The pharmaceutical and biotechnology industries are characterized by intense and dynamic competition with rapidly advancing technologies and a strong emphasis on proprietary products. While we believe our proprietary oligonucleotide chemistry; experience with the biological mechanisms related to imetelstat, telomeres and telomerase; clinical data to date indicating potential disease-modifying activity with imetelstat treatment; and knowledge and expertise around the development of potential treatments for myeloid hematologic malignancies provide us with competitive advantages, we face competition from many different sources, including major pharmaceutical, specialty pharmaceutical and biotechnology companies, academic institutions, governmental agencies, and public and private research institutions. Imetelstat will compete, if approved, with other products and therapies that currently exist, are being developed or will in the future be developed, some of which we may not currently be aware of.

If approved for commercial sale for the treatment of lower risk MDS, imetelstat would compete against a number of currently existing therapies, including ESAs and other hematopoietic growth factors that are indicated for anemia; immunomodulators, such as Revlimid (lenalidomide) by Celgene Corporation, a Bristol-Myers Squibb Corporation, or Celgene; hypomethylating agents, such as Vidaza (azacitidine) by Celgene and manufacturers of generic azacitidine; Dacogen (decitabine) by Otsuka America Pharmaceutical, Inc. and other manufacturers in the U.S. and Janssen in the EU; Inqovi (oral combination of decitabine and cedazuridine) by Astex Pharmaceuticals, Inc., or Astex; and Reblozyl (luspatercept), a TGF-beta inhibitor, by Acceleron Pharma, Inc., or Acceleron (acquired by Merck & Co., Inc., or Merck, in November 2021), in collaboration with Celgene. In November 2022, Bristol-Myers Squibb Company, or BMS, announced that the Phase 3 front-line COMMANDS trial that compared Reblozyl (luspatercept) to ESAs was positive and that data would be presented in 2023 at a major medical meeting.

Other therapies currently in Phase 3 development in lower risk MDS, some of which may obtain regulatory approval earlier than imetelstat include roxadustat, a hypoxia-inducible factor prolyl hydroxylase inhibitor, by FibroGen, Inc; Onureg (oral azacytidine) by BMS; and Hengqu (hetrombopag), an oral nonpeptide thrombopoietin receptor agonist, by Jiangsu Hengrui Pharmaceuticals Co., Ltd.

In addition, there are multiple Phase 1 and Phase 2 clinical trials of other agents being developed for lower risk MDS, including but not limited to: LB-100, a PP2A inhibitor, by Lixte Biotechnology Holdings, Inc.; bemcentinib, an AXL inhibitor, by BerGenBio ASA; H3B-8800, a spliceosome inhibitor, by H3 Biomedicine, Inc.; KER-050, a TGF-beta inhibitor, by Keros Therapeutics, Inc., or Keros Therapeutics; TP-0184, an inhibitor of ALK2 or ACVR1 kinase, by Sumitomo Dainippon Pharma Oncology, Inc; ilginatinib (NS-018), a JAK2 inhibitor, by NS Pharma, Inc., a U.S. subsidiary of Nippon Shinyaku Co., Ltd., or NS Pharma; RVT-2001, a SF3B1 modulator, by Roivant Sciences, Ltd.; sabatolimab (MBG453), a TIM-3 inhibitor, by Novartis AG; a lower dose of ASTX727, an oral formulation of decitabine and cedazuridine, referred to as ASTX727 LD, by Astex; ASTX030, an oral formulation of azacitidine and cedazuridine, by Astex; R289, an oral inhibitor of interleukin receptor-associated kinases 1 and 4, or IRAK1/4, by Rigel Pharmaceuticals, Inc.; a combination treatment regimen of luspatercept and lenalidomide by BMS; HuMax-IL8 (BMS-986253), an anti-IL-8 monoclonal antibody, by BMS and etavopivat, an oral, small molecule activator of erythrocyte pyruvate kinase (PKR) by Forma Therapeutics, Inc., a Novo Nordisk Company; canakinumab, an interleukin antagonist, by Novartis AG; and AG946, a next-generation pyruvate kinase-R (PKR) activator, by Agios Pharmaceuticals, Inc.

If approved for commercial sale for the treatment of MF, imetelstat would compete against currently approved JAK inhibitors: Jakafi (ruxolitinib) by Incyte Corporation, or Incyte, and Inrebic (fedratinib) by Celgene, as well as a kinase inhibitor, Vonjo (pacritinib), by CTI Biopharma Corp., which was approved in February 2022 for the treatment of adults with Intermediate or High-Risk primary or secondary myelofibrosis with a platelet count below 50×10^9/L. Other treatment modalities for MF include hydroxyurea for the management of splenomegaly, leukocytosis, thrombocytosis and constitutional symptoms; splenectomy and splenic irradiation for the management of splenomegaly and co-existing cytopenias; chemotherapy and pegylated interferon. Drugs for the treatment of MF-associated anemia include ESAs, androgens, danazol, corticosteroids, thalidomide and lenalidomide.

Other therapies currently in Phase 3 development in MF, some of which may obtain regulatory approval earlier than imetelstat, include momelotinib, a JAK inhibitor, by GlaxoSmithKline plc; or momelotinib plus AZD5153, a BET inhibitor by GlaxoSmithKline plc; pelabresib (CPI-0610), a BET inhibitor, by MorphoSys AG; navitoclax, a BCLXL, BCL-2 and BCLW inhibitor, by AbbVie, Inc.; and parsaclisib, a PI3K delta inhibitor, by Incyte. Other approaches for MF currently under investigation that could compete with imetelstat in the future include luspatercept; zinpentraxin alfa (RG6354, formerly PRM-151), an anti-fibrosis antibody, by F. Hoffmann-La Roche, Ltd.; LCL-161, an inhibitor of apoptosis protein (IAP), by Novartis; KRT-232, an inhibitor of MDM2, by Kartos Therapeutics, Inc.; GB2064, a LOXL2 inhibitor, by Galecto Biotech; elraglusib (9-ING-41), a glycogen synthase kinase-3 beta inhibitor, by Actuate Therapeutics, Inc.; XPOVIO (selinexor), a nuclear export inhibitor, by Karyopharm Therapeutics, Inc.; TL-895, an oral tyrosine kinase inhibitor, by Telios Pharma, Inc.; IMG-7289, a LSD1 inhibitor, by Imago Biosciences, Inc.; APG-1252, a dual BCL-2/BCL-XL inhibitor, by Ascentage Pharma; ilginatinib (NS-018), a JAK2 inhibitor by NS Pharma; DISC-0974, a monoclonal antibody against hemojuvelin (HJV) by DISC Management Inc.; KER-050 in combination with ruxolitinib, by Keros Therapeutics; CK0804, an allogeneic T-regulatory cell agent, by Cellenkos, Inc. in collaboration with Incyte; TP-3654, PIM kinase inhibitor by Sumitomo Pharma Co., Ltd.; and a mutated-CALR vaccine, a peptide-based vaccine, from the Icahn School of Medicine at Mount Sinai.

Smaller companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. We anticipate increased competition in the future as new companies explore treatments for myeloid hematologic malignancies, which may significantly impact the commercial viability of imetelstat. Academic institutions, government agencies and other public and private research organizations may also conduct research, seek patent protection and establish collaborative arrangements for research, clinical development and marketing of products similar to imetelstat. These companies and institutions compete with us in recruiting and retaining qualified development and management personnel as well as in acquiring technologies complementary to the imetelstat program.

Many of our competitors, either alone or with their strategic partners, could have substantially greater financial, technical and human resources than we do and significantly greater experience in obtaining FDA and other regulatory approvals of treatments and commercializing those treatments. We believe that the commercial success of imetelstat is subject to a number of factors, including:

- product efficacy and safety;
- method of product administration;
- cost of manufacturing;
- the timing and scope of regulatory consents;
- status of coverage and level of reimbursement;
- level of generic competition;
- price; and
- patent position, including potentially dominant patent positions of others.

As a result of the foregoing, competitors may develop more commercially desirable or affordable products than imetelstat, or achieve earlier patent protection or product commercialization than we may be able to achieve with imetelstat. Competitors have developed, or are in the process of developing, technologies that are, or in the future may be, competitive to imetelstat. Some of these products may have an entirely different approach or means of accomplishing therapeutic effects similar or superior to those that may be demonstrated by imetelstat. Competitors may develop products that are safer, more effective, or less costly than imetelstat, or more convenient to administer to patients and, therefore, present a serious competitive threat to imetelstat. In addition, competitors may price their products below what we may determine to be an acceptable price for imetelstat, may receive better third-party payor coverage and/or reimbursement, or may be more cost-effective than imetelstat. Such competitive products or activities by competitors may render imetelstat obsolete, which may cause us to cease any further development or future commercialization of imetelstat, which would severely and adversely affect our financial results, business and business prospects, and the future of imetelstat, and might cause us to cease operations.

To be commercially successful, imetelstat must be accepted by the healthcare community, which can be very slow to adopt or unreceptive to new technologies and products.

Even if approved for marketing, imetelstat may not achieve market acceptance, or the potential worldwide or U.S. revenue we believe may be possible, since hospitals, physicians, patients or the medical community in general may decide not to accept and utilize imetelstat. If approved for commercial sale, imetelstat will compete with a number of conventional and widely accepted drugs and therapies manufactured and marketed by major pharmaceutical companies. The degree of market acceptance of imetelstat will depend on a number of factors, including:

- the clinical indications for which imetelstat is approved, if any;
- the country and/or regions within which imetelstat is approved, if any;
- the establishment and demonstration to the medical community of the clinical efficacy and safety of imetelstat;
- the ability to demonstrate that imetelstat is superior to alternatives on the market at the time;
- the ability to establish in the medical community the potential advantages of imetelstat over alternative treatment methods, including with respect to efficacy, safety, cost or route of administration;
- the willingness of medical professionals to prescribe, and patients to use, imetelstat, or to continue to use imetelstat;
- the publication of unfavorable safety or efficacy data concerning imetelstat by third parties or us;
- restrictions on use of imetelstat in combination with other products;
- the label and promotional claims allowed by the FDA or similar international regulatory authorities for imetelstat, if any, including usage for only certain indications and any limitations or warnings about the prevalence or severity of any side effects;
- the timing of market introduction of imetelstat as well as competitive products, including sequencing of available products;
- the effectiveness of sales, marketing and distribution support for imetelstat, particularly during the remote COVID-19 environment;
- the extent to which imetelstat is approved for inclusion on formularies in hospitals and managed care organizations;
- the pricing of imetelstat, both in absolute terms and relative to alternative treatments;
- the availability of coverage and adequate reimbursement by government and third-party payors; and
- the willingness of patients to pay out-of-pocket in the absence of coverage by third-party payors, including governmental authorities.

The established use of conventional products competitive with imetelstat may limit or preclude the potential for imetelstat to receive market acceptance upon any commercialization. We may be unable to demonstrate any therapeutic or economic advantage for imetelstat compared to established or standard-of-care therapies, or newly developed therapies, for myeloid hematologic malignancies. Third-party payors may decide that any potential benefit that imetelstat may provide to clinical outcomes in myeloid hematologic malignancies is not adequate to justify the costs of treatment with imetelstat. If the healthcare community does not accept imetelstat for any of the foregoing reasons, or for any other reasons, our ability to further develop or potentially commercialize imetelstat may be negatively impacted or precluded altogether, which would seriously and adversely affect our business and business prospects.

If the market opportunities for imetelstat are smaller than we believe, our potential revenue may be adversely affected, and our business may suffer.

Our initial focus for imetelstat development has been on the lead indications, lower risk MDS and relapsed/refractory MF. The addressable patient populations, if imetelstat is approved in those indications, are based on our estimates. These estimates, which have been derived from a variety of sources, including scientific literature, surveys of clinics, patient foundations and market research, may prove to be incorrect. Further, new information from us or others may change the estimated incidence or prevalence of those indications.

Any regulatory approval of imetelstat would be limited to the therapeutic indications examined in our clinical trials and as determined by the FDA and similar international regulatory authorities, which would not permit us to market imetelstat for any other indications not expressly approved by those regulatory authorities. Additionally, the potentially addressable patient population for imetelstat may not ultimately be amenable to treatment with imetelstat. Even if we receive regulatory approval for imetelstat, such approval could be conditioned upon label restrictions that materially limit the addressable patient population.

Our market opportunity may also be limited by the pricing we are able to achieve for imetelstat, if approved, the quality and expiration of our intellectual property rights and licenses, and future competitor treatments that enter the market. If any of our estimates prove to be inaccurate, the market opportunities for imetelstat that we or any potential future collaborative partners develop could be significantly diminished which would have a material adverse impact on our business and business prospects.

The adoption of health policy changes and healthcare reform in the U.S. may adversely affect our business and financial results.

In the U.S. and some jurisdictions outside the U.S., there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could impact our business. Generally, there has been increasing legislative and enforcement interest in the U.S. with respect to drug pricing, including specialty drug pricing practices, in light of the rising cost of prescription drugs and biologics. Specifically, there have been U.S. Congressional inquiries and federal and state legislative activity designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, reduce the price of drugs under Medicare, and reform government program reimbursement methodologies for drugs and biologics. In July 2021, the Biden administration released an executive order, "Promoting Competition in the American Economy," with multiple provisions aimed at prescription drugs. In response to Biden's executive order, on September 9, 2021, the Department of Health and Human Services, or HHS, released a Comprehensive Plan for Addressing High Drug Prices that outlines principles for drug pricing reform and sets out a variety of potential legislative policies that Congress could pursue as well as potential administrative actions HHS can take to advance these principles. Furthermore, the Inflation Reduction Act of 2022, or the IRA, signed into law by President Biden on August 16, 2022, includes several provisions to lower prescription drug costs for people with Medicare and reduce drug spending by the federal government. Some of the specific provisions under the IRA that could impact us include:

- Requirement that the federal government negotiate prices for certain single-source drugs covered under Medicare Part B and D with the highest total spending, beginning in 2026; and
- Requirement that drug companies pay rebates to Medicare if prices rise faster than inflation for drugs used by Medicare beneficiaries, beginning in 2023.

Furthermore, the Biden administration released an additional executive order on October 14, 2022, directing HHS to submit a report on how the Center for Medicare and Medicaid Innovation can be further leveraged to test new models for lowering drug costs for Medicare and Medicaid beneficiaries. We expect that additional state and federal healthcare reform measures may be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could affect pricing for imetelstat if it is approved.

Moreover, the U.S. and some jurisdictions in other countries are considering or have enacted legislative and regulatory proposals to contain healthcare costs, as well as to improve quality and expand access. For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act, or collectively, the ACA was signed into law, which included a number of provisions of importance to the biopharmaceutical industry. There have been judicial and Congressional challenges to certain aspects of the ACA, and it is possible that the ACA will be subject to judicial or Congressional challenges in the future. In addition, the IRA, among other things, extends enhanced subsidies for individuals purchasing health insurance coverage in PPACA marketplaces through plan year 2025. The IRA also eliminates the "donut hole" under the Medicare Part D program beginning in 2025 by significantly lowering the beneficiary maximum out-of-pocket cost and creating a new manufacturer discount program. We expect that other healthcare reform measures that may be adopted in the future may result in more rigorous coverage criteria and lower reimbursement, and additional downward pressure on the price that may be charged for imetelstat. For additional details regarding healthcare reform measures that may affect our ability to operate see Item 1 "Business—Government Regulation—Reimbursement and Healthcare Reform" in our Annual Report on Form 10-K for the year ended December 31, 2022.

If future legislation were to impose direct governmental price controls and access restrictions, it could have a significant adverse impact on our business and financial results. Managed care organizations, as well as Medicaid and other government agencies, continue to seek price discounts. At the state level, legislatures have increasingly passed legislation and implemented regulations designed to control pharmaceutical and biologic product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, to encourage importation from other countries and bulk purchasing. Due to the volatility in the current economic and market dynamics, we are unable to predict the impact of any unforeseen or unknown legislative, regulatory, payor or policy actions, which may include cost containment and healthcare reform measures. Such policy actions could have a material adverse impact on future worldwide sales of imetelstat, if approved.

Cost control initiatives also could decrease the price that we may receive for imetelstat in the future. If imetelstat is not considered cost-effective or adequate third-party reimbursement for the users of imetelstat cannot be obtained, then we may be unable to maintain price levels sufficient to realize an appropriate return on our investment in imetelstat. Any of these events would severely and adversely affect our financial results, business and business prospects, and might cause us to cease operations.

If we fail to comply with federal, state and international healthcare laws, including fraud and abuse, transparency, and health information privacy and security laws, we could face substantial penalties and our business, results of operations, financial condition and prospects could be adversely affected.

Our business operations and current and future arrangements with investigators, healthcare professionals, consultants, third-party payors and customers, may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations, including federal and state fraud and abuse laws, including anti-kickback and false claims laws; data privacy and security laws, including the Health Insurance Portability and Accountability Act, or HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act, or HITECH; and transparency laws related to payments and/or other transfers of value made to physicians, other healthcare professionals and teaching hospitals. These laws may constrain the business or financial arrangements and relationships through which we conduct our operations, including how we research, market, sell and distribute imetelstat, if marketing approval is obtained. For details regarding the restrictions under applicable federal and state healthcare laws and regulations that may affect our ability to operate see Item 1 “Business—Government Regulation— Fraud and Abuse, Data Privacy and Security, and Transparency Laws and Regulations” in our Annual Report on Form 10-K for the year ended December 31, 2022.

Federal and state enforcement bodies have increased their scrutiny of interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry. If our operations are found to be in violation of any of these or any other healthcare and privacy-related regulatory laws that may apply to us, we may be subject to significant penalties, including the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, disgorgement, imprisonment, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, reputational harm, diminished profits and future earnings, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws, and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations. Defending against any such actions can be costly, time-consuming and may require significant financial and personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired.

Our employees, independent contractors, principal investigators, clinical trial sites, contract research organizations, consultants or vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

We are exposed to the risk that our employees, independent contractors, principal investigators, clinical trial sites, CROs, consultants or vendors may engage in fraudulent or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or disclosure of unauthorized activities to us that violate the FDA’s or similar international regulatory authorities’ regulations, including those laws requiring the reporting of true, complete and accurate information; manufacturing standards; healthcare fraud and abuse laws and regulations; or laws that require the true, complete and accurate reporting of financial information or data. Specifically, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements.

Activities subject to these laws also involve the improper use or misrepresentation of information obtained in the course of clinical trials or creating fraudulent data in our non-clinical studies or clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter misconduct by our employees and third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. Additionally, we are subject to the risk that a person could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of civil, criminal and administrative penalties, damages, monetary fines, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished potential profits and future earnings, and curtailment of our operations, any of which could adversely affect our business, financial condition, results of operations or prospects.

RISKS RELATED TO OUR COMMON STOCK AND FINANCIAL REPORTING

Historically, our stock price has been extremely volatile and your investment may suffer a decline in value.

Historically, our stock price has been extremely volatile. Between January 1, 2013 and December 31, 2022, our stock has traded as high as $7.79 per share and as low as $0.75 per share. Between January 1, 2022 and December 31, 2022, the price has ranged between a high of $3.06 per share and a low of $0.99 per share. The significant market price fluctuations of our common stock have been due to and may in the future be influenced by a variety of factors, including:

- announcements regarding our ability to timely submit applications for regulatory approvals of imetelstat in lower risk MDS;
- regulatory approval or non-approval of imetelstat, specific label indications for or restrictions, warnings or limitations in its use, or delays in the regulatory review process;
- announcements regarding the research and development of imetelstat, or adverse efficacy or safety results of, further delays in the commencement, enrollment or conduct of, discontinuation of, or further modifications or refinements to any current clinical trials of imetelstat, including IMerge Phase 3 or IMpactMF, IMproveMF and IMpress, or for potential future clinical trials of imetelstat, for any reason, or our inability, for any reason, to successfully continue the development of imetelstat;
- obtaining additional capital on commercially reasonable terms to further advance the imetelstat program, including through the completion of IMpactMF, IMproveMF and the investigator-led trial IMpress, and to conduct the clinical, regulatory and potential commercialization activities necessary to potentially bring imetelstat to market in relapsed/refractory MF and other future indications;
- timeliness of preliminary, interim or final clinical trial data expected to be reported with respect to current or potential future clinical trials of imetelstat, and investor perceptions thereof;
- not receiving timely regulatory clearances or approvals in any jurisdiction, whether within or outside of the U.S. to continue clinical development of imetelstat in relapsed/refractory MF, lower risk MDS or any additional myeloid hematologic malignancies in a timely manner or at all;
- changes in laws or regulations applicable to imetelstat, including but not limited to clinical trial requirements for approval;
- announcements regarding the safety of imetelstat and partial or full clinical holds placed on the imetelstat INDs by the FDA or similar international regulatory authorities, or other regulatory developments related to imetelstat;
- the successful completion of any clinical trials, regulatory approval and commercialization of imetelstat for one or more label expansion indications;
- announcements of technological innovations, new commercial products, or clinical progress or lack thereof by us, potential future collaborative partners or our competitors;
- adverse developments concerning our manufacturers, including our inability to obtain adequate product supply for imetelstat or inability to do so at acceptable prices;
- our failure to launch and commercialize imetelstat on the timelines anticipated, or at all;
- the size and growth of our lead indications, lower risk MDS and relapsed/refractory MF;

- announcements concerning imetelstat proprietary rights;
- the terms and timing of any future collaboration agreements for the development and potential commercialization of imetelstat that we may establish;
- announcements of significant acquisitions, strategic partnerships, collaborations, joint ventures or capital commitments by us or our competitors;
- our ability to acquire or in-license new product candidates to grow our pipeline;
- the demand in the market for our common stock;
- fluctuations in our operating results;
- increased or continuing operating losses;
- general domestic and international market conditions or market conditions relating to the biopharmaceutical and pharmaceutical industries, especially given the volatility caused by macroeconomic conditions like the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates or prospects of a recession;
- perceptions of the biotechnology and pharmaceutical industry by the public, legislature, regulators and the investment community;
- comments by securities analysts or other third parties, including blogs, articles and other media;
- our failure to meet the estimates and projections of the investment community or that we may otherwise provide to the public;
- publication of research reports about us or our industry, or positive or negative recommendations or withdrawal of research coverage by securities analysts;
- large stockholders increasing or exiting their position in our common stock or an increase in the short interest in our common stock;
- changes in the market valuations of similar companies;
- announcements of or developments concerning pending and potential future litigation;
- disputes or other developments relating to proprietary rights, including patents, litigation matters and our ability to obtain patent protection for our technologies;
- actions instituted by activist shareholders or others;
- the issuance of common stock to partners, vendors or investors to raise additional capital;
- other events or factors that are beyond our control; and
- the occurrence of any other risks and uncertainties discussed under the heading “Risk Factors.”

Stock prices and trading volumes for many biopharmaceutical companies fluctuate widely for a number of reasons, including factors which may be unrelated to their businesses or results of operations, such as media coverage, statements made on message boards and social media forums, legislative and regulatory measures and the activities of various interest groups or organizations. In addition to the risk factors described in this section, overall market volatility, as well as general domestic or international economic, market and political conditions, including those resulting from the effects of macroeconomic conditions like the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates or prospects of a recession, could materially and adversely affect the market price of our common stock and the return on your investment in our securities.

In addition, as further discussed in the Risk Factor above entitled *“We and certain of our officers have been named as defendants in pending securities class action lawsuits and shareholder derivative lawsuits. These lawsuits, and potential similar or related lawsuits, could result in substantial damages, divert management’s time and attention from our business, and have a material adverse effect on our results of operations. These lawsuits, and any other lawsuits to which we are subject, will be costly to defend or pursue and are uncertain in their outcome”*, we and one of our officers have been named as defendants in pending securities class action lawsuits. In addition, certain of our current officers and current and former board members have been named as defendants in the pending Derivative Lawsuits filed in the Northern District, the Court of Chancery of the State of Delaware, and the District

Court for the District of Delaware, respectively. Such lawsuits have often been instituted against companies, including us, whose securities have experienced periods of volatility in market price. The pending lawsuits and any lawsuits brought against us in the future could result in substantial costs, which would hurt our financial condition and results of operations and divert management's attention and resources, which could result in delays of IMpactMF, IMproveMF and IMpress, and/or could preclude or delay potential future clinical trials, or could preclude or delay commercialization efforts.

The sale of a substantial number of shares may adversely affect the market price of our common stock.

As of March 9, 2023, 508,722,486 shares of common stock are issued and outstanding, and we had reserved 166,207,514 shares of our common stock for future issuance pursuant to our stock option and equity incentive plans and outstanding warrants.

Future sales of our common stock or the perception that such sales could occur, or the issuance of common stock to fund our operations and imetelstat development, including pursuant to the 2020 Sales Agreement with B. Riley or upon the potential exercise of currently outstanding warrants, could cause immediate dilution and adversely affect the market price of our common stock. The sale or issuance of our securities, as well as the existence of outstanding stock options and shares of common stock reserved for issuance under our stock option and equity incentive plans and outstanding warrants, also may adversely affect the terms upon which we are able to obtain additional capital through the sale of equity securities, which could negatively affect the market price of our common stock and the return on stockholders' investment.

Our undesignated preferred stock may inhibit potential acquisition bids; this may adversely affect the market price of our common stock and the voting rights of holders of our common stock.

Our certificate of incorporation provides our board of directors with the authority to issue up to 3,000,000 shares of undesignated preferred stock and to determine or alter the rights, preferences, privileges and restrictions granted to or imported upon these shares without further vote or action by our stockholders. The issuance of shares of preferred stock may delay or prevent a change in control transaction without further action by our stockholders. As a result, the market price of our common stock may be adversely affected.

In addition, if in the future, we issue preferred stock that has preference over our common stock with respect to the payment of dividends or upon our liquidation, dissolution or winding up, or if we issue preferred stock with voting rights that dilute the voting power of our common stock, the rights of holders of our common stock or the market price of our common stock could be adversely affected.

Provisions in our charter, bylaws and Delaware law may inhibit potential acquisition bids for us, which may prevent holders of our common stock from benefiting from what they believe may be the positive aspects of acquisitions and takeovers.

Provisions of our charter documents and bylaws may make it substantially more difficult for a third-party to acquire control of us and may prevent changes in our management, including provisions that:

- prevent stockholders from taking actions by written consent;
- divide the board of directors into separate classes with terms of office that are structured to prevent all of the directors from being elected in any one year; and
- set forth procedures for nominating directors and submitting proposals for consideration at stockholders' meetings.

Provisions of Delaware law may also inhibit potential acquisition bids for us or prevent us from engaging in business combinations. In addition, we have individual severance agreements with our executive officers and a company-wide severance plan, either of which could require a potential acquirer to pay a higher price. Either collectively or individually, these provisions may prevent holders of our common stock from benefiting from what they may believe are the positive aspects of acquisitions and takeovers, including the potential realization of a higher rate of return on their investment from these types of transactions.

Our amended and restated bylaws provide that the Court of Chancery of the State of Delaware will be the sole and exclusive forum for certain types of actions and proceedings that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers, or employees.

Our amended and restated bylaws provide that, unless we consent to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for:

- any derivative action or proceeding brought on our behalf;
- any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or to our stockholders;
- any action asserting a claim arising pursuant to any provision of the General Corporation Law of the State of Delaware, our certificate of incorporation, or our bylaws; or
- any action asserting a claim governed by the internal affairs doctrine.

While the exclusive forum provisions in our bylaws do not apply to lawsuits brought to enforce a duty or liability created by the Exchange Act or the Securities Act of 1933, as amended, or any claim for which the federal courts have exclusive jurisdiction, these provisions may nonetheless limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our current or former directors, officers, or other employees, which may discourage such lawsuits against us and our current or former directors, officers, and other employees. Alternatively, if a court were to find the exclusive forum provisions contained in our bylaws to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could have a material and adverse impact on our business and our financial condition.

We do not intend to pay cash dividends on our common stock in the foreseeable future.

We do not anticipate paying cash dividends on our common stock in the foreseeable future. Any payment of cash dividends will depend upon our financial condition, results of operations, capital requirements and other factors, and will be at the discretion of our board of directors. In addition, the terms of our Loan Agreement prevent us from paying dividends and any future debt agreements may continue to preclude us from paying dividends. As a result, capital appreciation, if any, of our common stock will be the sole source of gain for our stockholders for the foreseeable future.

RISKS RELATED TO INFORMATION TECHNOLOGY SYSTEMS, DATA SECURITY AND DATA PRIVACY

If our information technology systems or data, or those of third parties upon which we rely, are or were compromised, we could experience adverse consequences resulting from such compromise, including, but not limited to, regulatory investigations and actions; litigation; fines and penalties; a disruption of our business operations such as our clinical trials; reputational harm; loss of revenue and profits; and other adverse consequences.

In the ordinary course of our business, we (and third parties upon which we rely) may collect, receive, store, process, use, transfer, make accessible, protect, secure, dispose of, transmit, disclose, or otherwise process (commonly known as processing) proprietary, confidential, and sensitive data, including personal data (such as health-related data and participant study related data), intellectual property, and trade secrets (collectively, sensitive information). In addition, we rely on third-party service providers to establish and maintain appropriate information technology and data security protections over the information technology systems they provide us to operate our critical business systems, including cloud-based infrastructure and systems, employee email, and data storage and management systems. However, except for contractual duties and obligations, we have limited ability to control their safeguards and actions related to such matters, and these third parties may not have adequate information security measures in place. Furthermore, while we may be entitled to damages if our third-party service providers fail to satisfy their privacy or security-related obligations to us, any award may be insufficient to cover our damages, or we may be unable to recover such award. We may share or receive sensitive information with or from third parties. In particular, the COVID-19 pandemic has caused us to modify our business and information technology practices, including that most of our employees continue to work remotely, which has increased risks to our information technology systems and data, as employees utilize network connections, computers, and devices outside our premises and networks, including working at home, while in transit and in public locations. Additionally, the prevalent use of mobile devices that access our sensitive information increases the risk of breaches.

Our information technology systems, including in our remote work environment as a result of the COVID-19 pandemic, and those of the third parties upon which we rely, are potentially vulnerable to evolving threats. These threats are prevalent, continue to increase, and come from a variety of sources such as "hackers," threat or internal bad actors, personnel (such as through theft, error or misuse), sophisticated nation states and nation-state-supported actors. These threats include, but are not limited to, social-engineering attacks, malicious code or malware, unauthorized intrusions, denial-of-service attacks, personnel misconduct or errors, ransomware attacks, supply-chain attacks, software bugs, computer viruses, server malfunctions, software, hardware or data center failures, loss of data or other information technology assets, natural disasters, terrorism, war, and telecommunication and electrical failures. In particular, ransomware attacks are becoming increasingly prevalent and severe and can lead to significant interruptions in operations, loss of data and income, reputational harm, and diversion of funds. If we were to experience such an attack, extortion payments might alleviate the negative impact of a ransomware attack, but we might be unwilling or unable to make such payments due to, for example, applicable laws or regulations prohibiting such payments. Similarly, supply-chain attacks and attacks on clinical trial sites as well as regulatory and health authorities have increased in frequency and severity, and we cannot guarantee that third parties and infrastructure in our supply chain or our third-party partners' supply chains, or of clinical trial sites and regulatory and health authorities, have not been compromised or that they do not contain exploitable defects or bugs that could result in a breach of or disruption to our information technology systems (including those related to imetelstat) or the third-party information technology systems that support us and the services provided to us. Any of the aforementioned threats may result in unauthorized, unlawful or accidental loss, corruption, access, modification, destruction, alteration, acquisition or disclosure of sensitive information, such as clinical trial data or information, intellectual property, proprietary business data and personal data. The costs to us to attempt to protect against such breaches could be significant, including potentially requiring us to modify our business (including non-clinical and clinical trial activities), and while we have implemented security measures designed to protect our information technology systems and to identify and remediate vulnerabilities, such measures may not be successful. We may be unable in the future to detect vulnerabilities in our information technology systems because such threats and techniques change frequently, are sophisticated in nature, and may not be detected until after a security incident has occurred.

If we or third parties upon which we rely experience or are perceived to have experienced a breach, we may experience adverse consequences. These consequences may include: government enforcement actions (for example, investigations, fines, penalties, audits, and inspections), interruptions in our operations, including disruption of our imetelstat development program, interruptions or restrictions on processing sensitive data (which could result in delays in obtaining, or our inability to obtain, regulatory approvals and significantly increase our costs to recover or reproduce the data), reputational harm, litigation (including class action claims), indemnification obligations, negative publicity, monetary fund diversions, financial loss, and other harms. In addition, such a breach may require notification of the breach to relevant stakeholders. Such disclosures are costly, and the disclosure or the failure to comply with such requirements could lead to adverse consequences.

Many of our contracts with relevant stakeholders include obligations relating to the safeguard of sensitive information, and a breach could lead to claims against us by such stakeholders. There can be no assurance that the limitations of liability in our contracts would be enforceable or adequate or would otherwise protect us from liabilities, damages, or claims relating to our data privacy and security obligations. In addition, failure to maintain effective internal accounting controls related to data security breaches and cybersecurity in general could impact our ability to produce timely and accurate financial statements and could subject us to regulatory scrutiny.

We are subject to stringent and changing U.S. and foreign laws, regulations, rules, contractual obligations, policies and other obligations related to data privacy and security. Our actual or perceived failure to comply with such obligations could lead to regulatory investigations and actions; litigation; fines and penalties; disruptions to our business operations; reputational harm; loss of revenue and profits; and other adverse business impacts.

In the ordinary course of business, we process personal data and other sensitive data, including proprietary and confidential business data, trade secrets, intellectual property, data we collect about trial participants in connection with clinical trials, and sensitive third-party data. We are therefore subject to or affected by numerous data privacy and security obligations, such as various federal, state, local and foreign laws, regulations, guidances, industry standards, external and internal privacy and security policies, contracts, and other obligations governing the processing of personal data by us and on our behalf. These obligations may change, are subject to differing interpretations and may be inconsistent among jurisdictions or conflict. The global data protection landscape is rapidly evolving, and implementation standards and enforcement practices are likely to remain uncertain for the foreseeable future. This evolution may create uncertainty in our business; affect us or our collaborators', service providers' and contractors' ability to operate in certain jurisdictions or to collect, store, transfer, use and share personal data; necessitate the acceptance of more onerous obligations in our contracts; result in liability; or impose additional costs on us. The cost of compliance with these laws, regulations and guidances is high and is likely to increase in the future. These obligations may necessitate changes to our information technologies, systems, and

practices and to those of any third parties that process personal data on our behalf. In addition, these obligations may require us to change our business model.

Outside the U.S., an increasing number of laws, regulations, and industry standards apply to data privacy and security. For example, the European Union's General Data Protection Regulation (GDPR) (EU) 2016/679, or the EU GDPR, imposes strict requirements on the processing of personal data. Under the EU GDPR, government regulators may impose temporary or definitive bans on data processing, as well as fines of up to €20 million or 4% of the annual global revenues of the noncompliant company, whichever is greater.

In addition, we may be unable to transfer personal data from Europe and other jurisdictions to the U.S. or other countries due to data localization requirements or limitations on cross-border data flows. Europe and other jurisdictions have enacted laws requiring data to be localized or limiting the transfer of personal data to other countries. In particular, the European Economic Area, or the EEA, and the United Kingdom, or UK, have significantly restricted the transfer of personal data to the United States and other countries whose privacy laws it believes are inadequate. Other jurisdictions may adopt similarly stringent interpretations of their data localization and cross-border data transfer laws. Although there are currently various mechanisms that may be used to transfer personal data from the EEA and UK to the U.S. in compliance with law, such as the EEA and UK's standard contractual clauses, these mechanisms are subject to legal challenges, and there is no assurance that we can satisfy or rely on these measures to lawfully transfer personal data to the U.S. If there is no lawful manner for us to transfer personal data from the EEA, the UK, or other jurisdictions to the U.S., or if the requirements for a legally-compliant transfer are too onerous, we could face significant adverse consequences, including the interruption or degradation of our operations, the need to relocate part of or all of our business or data processing activities to other jurisdictions at significant expense, increased exposure to regulatory actions, substantial fines and penalties, the inability to transfer data and work with partners, vendors and other third parties, and injunctions against our processing or transferring of personal data necessary to operate our business. Some European regulators have prevented companies from transferring personal data out of Europe for allegedly violating the GDPR's cross-border data transfer limitations.

Likewise, we expect that there will continue to be new proposed laws, regulations and industry standards relating to privacy and data protection in the U.S. For example, HIPAA, as amended by HITECH, imposes specific requirements relating to the privacy, security, and transmission of individually identifiable health data. Additionally, the California Consumer Privacy Act of 2018, or CCPA, imposes obligations on businesses to which it applies. These obligations include, but are not limited to, providing specific disclosures in privacy notices and affording California residents certain rights related to their personal data. The CCPA allows for statutory fines for noncompliance (up to $7,500 per violation). While the CCPA contains limited exceptions for clinical trial data, the CCPA's implementation standards and enforcement practices are likely to remain uncertain for the foreseeable future. It is anticipated that the California Privacy Rights Act of 2020, or CPRA, will expand the CCPA. For example, the CPRA establishes a new California Privacy Protection Agency to implement and enforce the CPRA, which could increase the risk of an enforcement action, and applies to personal information of business representatives and employees. Other states have also enacted data privacy laws. For example, Virginia passed the Consumer Data Protection Act, and Colorado passed the Colorado Privacy Act, both of which differ from the CPRA and become effective in 2023. If we become subject to new data privacy laws, at the state level or otherwise, the risk of enforcement action against us could increase because we may become subject to additional obligations, and the number of individuals or entities that can initiate actions against us may increase (including individuals, via a private right of action, and state actors).

In addition to data privacy and security laws, we may be contractually subject to industry standards adopted by industry groups and may become subject to such obligations in the future. We may also be bound by other contractual obligations related to data privacy and security, and our efforts to comply with such obligations may not be successful. We may publish privacy policies, marketing materials, and other statements, such as compliance with certain certifications or self-regulatory principles, regarding data privacy and security. If these policies, materials or statements are found to be deficient, lacking in transparency, deceptive, unfair, or misrepresentative of our practices, we may be subject to investigation, enforcement actions by regulators, or other adverse consequences.

Although we endeavor to comply with all applicable data privacy and security obligations, we may at times fail to do so or may be perceived to have failed to do so. Moreover, despite our efforts, we may not be successful in achieving compliance if our personnel or third parties upon whom we rely fail to comply with such obligations, which could negatively impact our business operations and compliance posture. For example, any failure by a third-party processor, including our clinical trial sites, to comply with applicable law, regulations, or contractual obligations could result in adverse effects, including inability to operate our business and proceedings against us by governmental entities or others. If we fail, or are perceived to have failed, to address or comply with data privacy and security obligations, we could face significant consequences. These consequences may include, but are not

limited to, government enforcement actions (e.g., investigations, fines, penalties, audits, inspections, and similar activities); litigation (including class-related claims); additional reporting requirements and/or oversight; bans on processing personal data; orders to destroy or not use personal data; and imprisonment of company officials. Any of these events could have a material adverse effect on our reputation, business, or financial condition, including but not limited to: interruptions or stoppages in our business operations (including, as relevant, our clinical trials if any); inability to process personal data or to operate in certain jurisdictions; limited ability to develop or commercialize imetelstat; expenditure of time and resources to defend any claim or inquiry; adverse publicity; or revision or restructuring of our operations. Moreover, clinical trial participants or research subjects about whom we or our vendors obtain information, as well as the providers who share this information with us, may contractually limit our ability to use and disclose the information.

GENERAL RISK FACTORS

Business disruptions could seriously harm our future revenue and financial condition and increase our costs and expenses.

Our operations, and those of our CROs, suppliers, and other contractors and consultants, could be subject to earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, public health pandemics or epidemics (including, for example, the ongoing COVID-19 pandemic), civil or political unrest or military conflicts around the world (such as the current military conflict between Ukraine and Russia), terrorism, insurrection or war, and other natural or man-made disasters or business interruptions. Furthermore, other events, such as the armed conflict between Russia and Ukraine, could lead to sanctions, embargoes, supply shortages, regional instability, geopolitical shifts, cyberattacks, other retaliatory actions, and adverse effects on macroeconomic conditions, currency exchange rates, and financial markets, which could adversely impact our operations and financial results, as well as those of third parties with whom we conduct business. There is a risk that one or more of our CROs, suppliers, and other contractors and consultants might not survive an economic downturn. The occurrence of any of these business disruptions could seriously harm our operations and financial condition and increase our costs and expenses.

Our ability to develop and potentially commercialize imetelstat could be disrupted if our operations or those of our CROs and other contractors or consultants are affected by geopolitical events, man-made or natural disasters or other business interruptions. Our corporate headquarters are located in California near major earthquake faults and fire zones. The ultimate impact on us, our CROs, contractors and consultants, and our general infrastructure of being located near major earthquake faults and fire zones and being consolidated in certain geographical areas is unknown, but our operations and financial condition could suffer in the event of a major earthquake, fire or other natural disaster.

Changes in tax laws or regulations that are applied adversely to us or our customers may have a material adverse effect on our business, cash flow, financial condition or results of operations.

New income, sales, use, excise or other tax laws, statutes, rules, regulations or ordinances could be enacted at any time, which could affect the tax treatment of our domestic and foreign sales and earnings. Any new taxes could adversely affect our domestic and international business operations and our business and financial condition. Further, existing tax laws, statutes, rules, regulations or ordinances could be interpreted, changed, modified or applied adversely to us. For example, the Tax Act, as modified by the CARES Act, significantly revised the Code, and recently enacted federal tax legislation made additional changes. Future guidance from the U.S. Internal Revenue Service and other tax authorities with respect to such legislation may adversely affect us, and certain aspects of such legislation could be repealed or modified in the future, which could have an adverse effect on us. For example, the recently enacted Inflation Reduction Act of 2022, or the Inflation Reduction Act, includes provisions that will impact the U.S. federal income taxation of corporations, including imposing a minimum tax on the book income of certain large corporations and an excise tax on certain corporate stock repurchases that would be imposed on the corporation repurchasing such stock. It is uncertain if and to what extent various states will conform to the Tax Act, the CARES Act, the Inflation Reduction Act or any newly enacted federal tax legislation. Changes in corporate tax rates, the realization of net deferred tax assets relating to our U.S. operations, the taxation of earnings from other countries, and the deductibility of expenses under the Tax Act or future tax reform legislation could have a material impact on the value of our deferred tax assets, could result in significant one-time charges in the current or future taxable years, and could increase our future U.S. tax expense.

Failure to achieve and maintain effective internal controls in accordance with Section 404 of the Sarbanes-Oxley Act of 2002 could have a material adverse effect on our business and stock price.

Section 404 of the Sarbanes-Oxley Act of 2002, or Section 404, requires that we establish and maintain an adequate internal control structure and procedures for financial reporting. Our Annual Reports on Form 10-K must contain an annual assessment by management of the effectiveness of our internal control over financial reporting and must include disclosure of any material weaknesses in internal control over financial reporting that we have identified. In the past, our independent registered public accounting firm provided an opinion annually on the effectiveness of our internal control over financial reporting. As a smaller reporting company, we are no longer subject to this requirement.

The requirements of Section 404 are ongoing and also apply to future years. We expect that our internal control over financial reporting will continue to evolve as our business develops. Although we are committed to continue to improve our internal control processes and we will continue to diligently and vigorously review our internal control over financial reporting in order to ensure compliance with Section 404 requirements, any control system, regardless of how well designed, operated and evaluated, can provide only reasonable, not absolute, assurance that its objectives will be met. Therefore, we cannot assure you that material weaknesses or significant deficiencies will not exist or otherwise be discovered in the future, particularly in light of our increased reliance on personnel working remotely as a result of the COVID-19 pandemic. If material weaknesses or other significant deficiencies occur, such weaknesses or deficiencies could result in misstatements of our results of operations, restatements of our financial statements, a decline in our stock price, or other material adverse effects on our business, reputation, results of operations, financial condition or liquidity.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

In April 2019, we entered into an operating lease agreement for office space located at 3 Sylvan Way, Parsippany, New Jersey, or the New Jersey Lease. The initial term of the New Jersey Lease is 11 years with an option to extend for an additional five years and a one-time option to terminate the New Jersey Lease without cause as of the 103rd month anniversary of the commencement date of the lease. The New Jersey Lease commenced on October 1, 2019, upon our control of the office space on that date.

In October 2019, we entered into an operating lease agreement for office space located at 919 East Hillsdale Boulevard, Foster City, California, or the Foster City Lease. The initial term of the Foster City Lease is 87 months with an option to extend for an additional five years. The Foster City Lease commenced on March 10, 2020, upon our control of the office space on that date.

ITEM 3. LEGAL PROCEEDINGS

See Note 6 on Commitments and Contingencies in Notes to Consolidated Financial Statements of this annual report on Form 10-K for information on legal proceedings.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR THE REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information

Our common stock is quoted on the Nasdaq Global Select Market under the symbol GERN. As of March 9, 2023, there were approximately 469 stockholders of record of our common stock. This number does not include "street name" or beneficial holders, whose shares are held of record by banks, brokers and other financial institutions.

Dividend Policy

We have never paid cash dividends on our capital stock and do not anticipate paying cash dividends in the foreseeable future, but intend to retain our capital resources for reinvestment in our business. Any future determination to pay cash dividends will be at the discretion of the board of directors and will be dependent upon our financial condition, results of operations, capital requirements and other factors our board of directors deems relevant.

Recent Sales of Unregistered Securities

During the year ended December 31, 2022, there were no unregistered sales of equity securities by us.

ITEM 6. [RESERVED]

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following discussion should be read in conjunction with the section entitled "Business" in Part I, Item 1 and the audited financial statements and notes thereto included in Part II, Item 8 of this annual report on Form 10-K. The information provided should be reviewed in the context of the sections entitled "Risks Related to the Development of Imetelstat", "Risks Related to COVID-19" and "Risks Related to Regulatory Compliance Matters and Commercialization of Imetelstat" under "Risk Factors" in Part I, Item 1A and elsewhere in this annual report on Form 10-K.

Company Overview

Summary

We are a late-stage biopharmaceutical company pursuing therapies with the potential to extend and enrich the lives of patients living with hematologic malignancies. Our investigational first-in-class telomerase inhibitor, imetelstat, harnesses Nobel Prize winning science in a treatment that may alter the underlying course of these diseases.

Our lead indication for imetelstat is in Low or Intermediate-1 risk myelodysplastic syndromes, or lower risk MDS. In January 2023, we reported positive top-line results from our IMerge Phase 3 clinical trial. The trial met its primary endpoint of 8-week transfusion independence rate and a key secondary endpoint of 24-week transfusion independence rate, demonstrating highly statistically significant (i.e., $P<0.001$ for both) and clinically meaningful benefits in imetelstat versus placebo. Furthermore, statistically significant and clinically meaningful efficacy results were observed in the trial across key subtypes, including patients who were ringed sideroblast positive, or RS positive, and ringed sideroblast negative, or RS negative; patients with high and very high baseline transfusion burden; and patients classified as Low or Intermediate-1 risk according to the International Prognostic Scoring System, or IPSS.

Based on the positive top-line data from IMerge Phase 3 and the prior IMerge Phase 2, we plan to submit a New Drug Application, or NDA, to the FDA in the U.S. in mid-2023 and a marketing authorization application, or MAA, in Europe in the second half of 2023 for the use of imetelstat in adult patients with lower risk MDS. If the NDA is accepted for filing and imetelstat is approved for commercialization by the FDA within the timelines we expect, we anticipate commercial launch of imetelstat in lower risk MDS in the U.S. could occur in the first half of 2024. In Europe, we anticipate review of the planned MAA, if validated by the European Medicines Agency, or EMA, could take approximately 14 months and, if approved, we anticipate that the commercial launch of imetelstat in lower risk MDS in Europe could occur by the end of 2024.

We believe that the positive top-line data from IMerge Phase 3 and IMerge Phase 2, as well as our prior Phase 2 clinical trial of imetelstat in patients with Intermediate-2 or High-Risk myelofibrosis who have relapsed after or are refractory to treatment with a janus associate kinase inhibitor, or JAK inhibitor, or relapsed/refractory MF, provide strong evidence that imetelstat targets telomerase to inhibit the uncontrolled proliferation of malignant stem and progenitor cells enabling recovery of bone marrow and normal blood cell production, which suggest potential disease-modifying activity. We believe this potential for disease modification could differentiate imetelstat from currently approved treatments in myeloid hematologic malignancies. Accordingly, in addition to lower risk MDS,

we are developing imetelstat for the treatment of several myeloid hematologic malignancies with the following ongoing clinical trials:

- IMpactMF, a Phase 3 clinical trial in relapsed/refractory MF with overall survival, or OS, as the primary endpoint, that currently is enrolling patients. Based on our planning assumptions for enrollment and event (death) rates in the trial, we expect the interim analysis for OS in IMpactMF may occur in 2024, and the final analysis may occur in 2025. Because these analyses are event-driven and it is uncertain whether actual rates for enrollment and events will reflect current planning assumptions, the results may be available at different times than currently expected;
- IMproveMF, a Phase 1 combination clinical trial in first-line Intermediate-1, Intermediate-2 or High-Risk myelofibrosis, or frontline MF, that currently is enrolling patients and the first patient was dosed in April 2021; and
- IMpress, an investigator-led Phase 2 clinical trial in Intermediate-2 or High-Risk myelodysplastic syndromes, or higher risk MDS, and acute myeloid leukemia, or AML, with the initial clinical site planned to open in 2023.

Note on the COVID-19 Pandemic

The ongoing COVID-19 pandemic is having widespread, continually evolving, and unpredictable impacts on global societies, economies, financial markets, and business practices. We are closely monitoring the impact of the pandemic, the identification of new variants of the COVID-19 virus and related developments, and our focus remains on promoting employee health and safety while continuing to advance the development of imetelstat. For discussion regarding the impact of the COVID-19 pandemic on our business and financial results, see the sub-section entitled “Risks Related to COVID-19” under “Risk Factors” in Part I, Item 1A and Note 6 on Commitments and Contingencies – Risks Related to Global Economic Conditions, COVID-19 and the Military Conflict Between Ukraine and Russia in Notes to Consolidated Financial Statements of this annual report on Form 10-K.

Financial Overview

Since our inception, we have primarily financed our operations through the sale of equity securities, interest income on our marketable securities and payments we received under our collaborative and licensing arrangements. As of December 31, 2022, we had approximately $173.1 million in cash, cash equivalents, restricted cash and current and noncurrent marketable securities, and a long-term debt principal balance of $50.0 million.

On January 10, 2023, we completed an underwritten public offering of 68,007,741 shares of our common stock and a pre-funded warrant to purchase 25,000,000 shares of our common stock, or the 2023 pre-funded warrant. The net cash proceeds from this offering are approximately $213.3 million, after deducting the underwriting discount and other offering expenses paid by us, and excludes any future proceeds from the exercise of the 2023 pre-funded warrant. In addition, from January 1, 2023 through March 9, 2023, we have received $59.8 million in cash proceeds from the exercise of outstanding warrants.

In June 2021, we drew down the remaining $10.0 million available under Tranche A of the Loan Agreement with Hercules and SVB. In August 2021, we amended the Loan Agreement to adjust the timing threshold for certain clinical milestones associated with Tranche B under the Loan Agreement. In addition, under the amended Loan Agreement, the minimum cash covenant requirement beginning as of June 1, 2022, was increased from $25.0 million to $30.0 million, and the minimum cash covenant required upon the execution of certain licensing transactions being executed was increased from $30.0 million to $35.0 million. All other terms of the Loan Agreement were unchanged, including the maturity date, interest rate, payment terms, events of default and other covenants.

In December 2021, we drew down $15.0 million available under Tranche B of the Loan Agreement with Hercules and SVB.

On June 30, 2022, we entered into a second amendment to the Loan Agreement. Under the second amendment, the aggregate principal amount available to us increased from $75.0 million to $125.0 million with such principal being available in a series of tranches, subject to certain terms and conditions. As of March 9, 2023, remaining tranches of up to $55.0 million are available under the Loan Agreement, subject to certain conditions. However, on March 10, 2023, the Federal Deposit Insurance Corporation, or FDIC, issued a press release stating that SVB was closed by the California Department of Financial Protection and Innovation, which appointed the FDIC as receiver. Of the remaining term commitments under the Loan Agreement, Hercules and its affiliates hold 65% and 35% were held by SVB. As a result of the closure of SVB, we do not know whether Hercules and SVB’s

successor, if any, will fund their respective portions of the remaining term commitments or whether and to what extent we will otherwise be able to draw down the remaining $55.0 million under the Loan Agreement, even if we meet the conditions set forth in the Loan Agreement necessary for additional draw downs, and it is possible that we will not be able to access any additional funding under the Loan Agreement. See Note 8 on Debt in Notes to Consolidated Financial Statements of this annual report on Form 10-K for additional information on the Loan Agreement.

Substantially all of our revenues to date have been payments under collaboration agreements, and milestones, royalties and other revenues from our licensing arrangements. We currently have no source of product revenue. While we reported a small profit for the year ended December 31, 2015 due to our recognition of revenue in connection with the upfront payment under a former imetelstat collaboration agreement, until 2015 we had never been profitable, and have not reported any profit since. We have incurred significant net losses since our inception in 1990, resulting principally from costs incurred in connection with our research and development activities and from general and administrative costs associated with our operations. As of December 31, 2022, we had an accumulated deficit of approximately $1.4 billion.

The significance of future losses, future revenues and any potential future profitability will depend primarily on the clinical and commercial success of imetelstat, our sole product candidate. In any event, imetelstat may require significant additional clinical testing prior to possible regulatory approval in the U.S. and other countries. We expect research and development expenses, general and administrative expenses, and losses to substantially increase in future periods as we continue to support the imetelstat development program, including the conduct and completion of IMpactMF, IMproveMF and IMpress, as well as the potential U.S. commercialization of imetelstat lower risk MDS.

Based on our current operating plan and our expectations regarding the timing of the submission and potential acceptance and approval of our planned NDA by the FDA for imetelstat in lower risk MDS and the potential commercialization in the U.S. for the use of imetelstat in adult patients with lower risk MDS, we believe that our existing cash, cash equivalents, restricted cash and current and noncurrent marketable securities, including the net cash proceeds from our recently closed underwritten public offering in January 2023 and the cash proceeds from the exercise of warrants that we received in the January and February 2023, will be sufficient to fund our projected operating requirements through the end of the third quarter of 2025, which includes the potential U.S. commercial launch of imetelstat in lower risk MDS in the first half of 2024. In the absence of potential proceeds from exercises of currently outstanding warrants and potential drawdowns under the Loan Agreement, we will require substantial additional funding to further advance the imetelstat program, including through the completion of IMpactMF, IMproveMF and the investigator-led trial IMpress, as well as conducting the clinical, regulatory and potential commercialization activities necessary to potentially bring imetelstat to market in relapsed/refractory MF and any other future indications, and our need for additional funds may arise sooner than planned. We cannot predict with any certainty whether and to what extent the outstanding warrants will be exercised for cash, or the timing or availability of additional funds under the Loan Agreement, if at all, particularly given the recent closure of SVB by banking regulators.

If approved for marketing by regulatory authorities outside of the U.S., we may seek potential commercialization partners for such territories. Until the FDA or similar international regulatory authorities approve imetelstat for marketing in lower risk MDS, if at all, we cannot begin commercialization.

Critical Accounting Policies and Estimates

Our consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America. The preparation of our consolidated financial statements requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses. Note 1 of Notes to Consolidated Financial Statements of this annual report on Form 10-K describes the significant accounting policies used in the preparation of our consolidated financial statements. Certain of these significant accounting estimates are considered to be critical, as defined below.

A critical accounting estimate is defined as one that is both material to the presentation of our consolidated financial statements and requires management to make difficult, subjective or complex judgments that could have a material effect on our financial condition and results of operations. Specifically, critical accounting estimates have the following attributes: (i) we are required to make assumptions about matters that are highly uncertain at the time of the estimate; and (ii) different estimates we could reasonably have used, or changes in the estimate that are reasonably likely to occur, would have a material effect on our financial condition or results of operations.

Estimates and assumptions about future events and their effects cannot be determined with certainty. We base our estimates on historical experience and on various other assumptions believed to be applicable and reasonable under the circumstances. These estimates may change as new events occur, as additional information is obtained and as our operating environment changes. These changes historically have been minor and have been included in the consolidated financial statements as soon as they became known. Based on a critical assessment of our accounting policies and the underlying judgments and uncertainties affecting the application of those policies, management believes that our financial statements are stated fairly in accordance with accounting principles generally accepted in the U.S., and meaningfully present our financial condition and results of operations.

We believe the following accounting estimates reflect our critical estimates and assumptions used in the preparation of our consolidated financial statements:

Fair Value of Financial Instruments

We categorize financial instruments recorded at fair value on our consolidated balance sheets based upon the level of judgment associated with inputs used to measure their fair value. The categories are as follows:

Level 1—Inputs are unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date. An active market for the asset or liability is a market in which transactions for the asset or liability occur with sufficient frequency and volume to provide pricing information on an ongoing basis.

Level 2—Inputs (other than quoted market prices included in Level 1) are either directly or indirectly observable for the asset or liability through correlation with market data at the measurement date and for the duration of the instrument's anticipated life.

Level 3—Inputs reflect management's best estimate of what market participants would use in pricing the asset or liability at the measurement date. Consideration is given to the risk inherent in the valuation technique and the risk inherent in the inputs to the model.

A financial instrument's categorization within the valuation hierarchy is based upon the lowest level of input that is significant to the fair value measurement. Following is a description of the valuation methodologies used for financial instruments measured at fair value on our consolidated balance sheets, including the category for such financial instruments.

Financial instruments classified as Level 1 include money market funds and certificates of deposit, representing approximately 26% of our total financial instruments classified as assets measured at fair value as of December 31, 2022. Financial instruments classified as Level 2 include commercial paper, government-sponsored enterprise securities, U.S. Treasury securities, municipal securities, and corporate notes, representing approximately 74% of our total financial instruments classified as assets measured at fair value as of December 31, 2022. The price for each security at the measurement date is derived from various sources. Periodically, we assess the reasonableness of these sourced prices by comparing them to the prices provided by our portfolio managers from broker quotes as well as reviewing the pricing methodologies used by our portfolio managers. Historically, we have not experienced significant deviation between the sourced prices and our portfolio managers' prices.

For a further discussion regarding fair value measurements, see Note 2 on Fair Value Measurements in Notes to Consolidated Financial Statements of this annual report on Form 10-K.

Leases

At the inception of an arrangement, we determine whether the arrangement is or contains a lease based on the unique facts and circumstances present. Operating leases are included in operating leases, right-of-use assets and lease liabilities on our consolidated balance sheets. Right-of-use assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. Operating lease liabilities and their corresponding right-of-use assets are recorded based on the present value of remaining lease payments over the expected lease term. The present value of remaining lease payments within the 12 months following the balance sheet date are classified as current lease liabilities. The present value of lease payments not within the 12 months following the balance sheet date are classified as noncurrent lease liabilities.

The interest rate implicit in lease contracts to calculate the present value is typically not readily determinable. As such, significant management judgment is required to estimate the incremental borrowing rate, which is the rate incurred to borrow on a collateralized basis over a similar term an amount equal to the lease payments in a similar economic environment as of the lease commencement date. We evaluate the assumptions used in estimating the

incremental borrowing rate by reviewing industry and regional data for operating leases and loans with similar terms. We have not made any revisions to borrowing rate estimates. If the basis for the incremental borrowing rate estimate were to change, then the present value of remaining lease payments could differ significantly which would affect the value recognized for the right-of-use assets and corresponding lease liabilities on our consolidated balance sheets. See Note 7 on Operating Leases in Notes to Consolidated Financial Statements of this annual report on Form 10-K for further discussion of our operating lease obligations.

Clinical Trial Accruals

Our current imetelstat clinical trials are being supported by CROs and other vendors. Invoicing from CROs for services rendered can be delayed several months, or longer. We accrue the cost of services rendered in connection with CRO activities based on our estimate of site management, monitoring costs, project management costs, and investigator fees. We accrue expenses for clinical trial activities performed by CROs based upon the estimated amount of work completed on each trial. We maintain regular communications with our CROs to assess the reasonableness of our estimates. To date, differences between actual clinical trial expenses and estimated clinical trial expenses recorded have not been material and are adjusted for in the period in which they become known. However, if we incorrectly estimate activity levels associated with the CRO services at a given point in time, we could be required to record material adjustments in future periods.

For clinical trial expenses and related expenses associated with the conduct of clinical trials, the significant factors used in estimating accruals include the number of patients enrolled, the number of active clinical sites, and the duration for which the patients have been enrolled in the trial. We monitor patient enrollment levels and related activities to the extent possible through internal reviews, review of contractual terms and correspondence with CROs.

Valuation of Stock-Based Compensation

We measure and recognize compensation expense for all share-based payment awards to our employees and directors, including service-based and performance-based stock options, restricted stock awards and employee stock purchases related to our Employee Stock Purchase Plan, or ESPP, based on estimated grant-date fair values for these instruments. The grant-date fair value of share-based payment awards is amortized over the vesting period of the awards using a straight-line method and reduced for estimated forfeitures. For performance-based stock options with vesting conditioned on the achievement of certain strategic milestones, stock-based compensation expense is recognized over the period from the date the performance condition is determined to be probable of occurring through the date the applicable condition is expected to be met and is reduced for estimated forfeitures, as applicable. If the performance condition is not considered probable of being achieved, no stock-based compensation expense is recognized until such time as the performance condition is considered probable of being met, if at all. If that assessment of the probability of the performance condition being met changes, the impact of the change in estimate would be recognized in the period of the change. We use the Black Scholes option-pricing model to estimate the grant-date fair value of our service-based and performance-based stock options and employee stock purchases.

Option-pricing model assumptions, such as expected volatility, expected term and risk-free interest rate, impact the fair value estimate. Expected volatilities are based on historical volatilities of our stock since traded options on our common stock do not correspond to option terms and trading volume of options is limited. The expected term of stock options represents the period of time that stock options granted are expected to be outstanding. In deriving this assumption, we review actual historical exercise and post-vesting cancellation data and the remaining outstanding stock options not yet exercised or cancelled. For performance-based stock options, we also assess the projected timing of potential achievement of the milestones. The expected term of employees' purchase rights under our ESPP is equal to the purchase period. The risk-free interest rate is based on the U.S. Zero Coupon Treasury Strip Yields for the expected term in effect on the date of grant. Forfeiture rates are estimated based on historical data and are adjusted, if necessary, over the requisite service period based on the extent to which actual forfeitures differ, or are expected to differ, from their estimate.

We evaluate the assumptions used in estimating grant-date fair values of our share-based payment awards by reviewing current trends in comparison to historical data on an annual basis. We evaluate whether an adjustment to the assumptions of fair value of our common stock and historical volatility are required if observed prices of our common stock materially differ from historical information. We have not revised the methods by which we derive assumptions in order to estimate grant-date fair values of our share-based payment awards. If factors change and we employ different assumptions in future periods, the stock-based compensation expense that we record for share-based payment awards to employees and directors may differ significantly from what we have recorded in the current period.

Results of Operations

Our results of operations have fluctuated from period to period and may continue to fluctuate in the future. Results of operations for any period may be unrelated to results of operations for any other period. Thus, historical results should not be viewed as indicative of future operating results.

Revenue based on sales of imetelstat is dependent on obtaining regulatory approval to commercialize imetelstat in the U.S. and other countries. We are subject to risks common to companies in our industry and at our stage of development, including, but not limited to, risks inherent in research and development efforts, including the development, manufacture, regulatory approval for and commercialization of, imetelstat; uncertainty of non-clinical and clinical trial results or regulatory approvals or clearances; the future development of imetelstat by us, including any future efficacy or safety results that may cause the benefit-risk profile of imetelstat to become unacceptable; the uncertain and unpredictable drug research and discovery process; overcoming disruptions and/or delays due to the COVID-19 pandemic or geopolitical events; our need for substantial additional capital; enforcement of our patent and proprietary rights; reliance upon our CROs, contract manufacturing organizations, or CMOs, consultants, licensees, investigators and other third parties; and potential competition. In order for imetelstat to be commercialized, we must conduct non-clinical tests and clinical trials to demonstrate the safety and efficacy of imetelstat, obtain regulatory approvals or clearances and enter into manufacturing, distribution and marketing arrangements, as well as obtain market acceptance.

Revenues

We previously entered into license or collaboration agreements with companies involved with oncology, diagnostics, research tools and biologics production, whereby we granted certain rights to our non-imetelstat related technologies. As of December 31, 2020, our license agreements related to our hTERT technology have been terminated or expired due to patent expirations on such technology. The remaining active license agreement was a license related to our specialized oligonucleotide backbone chemistry, as well as patent rights covering the synthesis of monomers, the building blocks of oligonucleotides. This license was terminated effective April 2021. In connection with these agreements, we were eligible to receive license fees, option fees, milestone payments and royalties on future sales of products, or any combination thereof. Also, in connection with the divestiture of Geron's human embryonic stem cell assets, including intellectual property and proprietary technology, to Lineage Cell Therapeutics, Inc. (formerly BioTime, Inc. which acquired Asterias Biotherapeutics, Inc.) in 2013, we are entitled to receive royalties on sales from certain research or commercial products utilizing Geron's divested intellectual property.

We did not recognize any license fee revenues during the year ended December 31, 2022 and recognized license fee revenues of $28,000 and $55,000 in for the years ended December 31, 2021 and 2020, respectively, related to our various agreements. The decrease in license fee revenues in 2022 and 2021 primarily reflects a reduction in the number of active license agreements in 2020 for research licenses related to our hTERT technology, due to the patent expirations on such technology.

We recognized royalty revenues of $596,000, $1.4 million and $198,000 during the years ended December 31, 2022, 2021 and 2020, respectively. Royalty revenues in 2022, 2021 and 2020 primarily reflect estimated royalties from sales of cell-based research products from our divested stem cell assets. The decrease in royalty revenues in 2022 and the increase in royalty revenues in 2021 primarily reflects retroactive royalties of approximately $911,000 on product sales of cell-based research products received in 2021.

Future license fee and royalty revenues are dependent on additional agreements being signed, if any, our current license agreement being maintained and the underlying patent rights for the license remaining active. Historical revenues may not be predictive of future revenues. We expect revenues in 2023 to be lower than 2022 as a result of reduced royalties from sales of cell-based research products from our divested stem cell assets.

Research and Development Expenses

During the years ended December 31, 2022 and 2021, we supported the imetelstat development programs and a research discovery program related to potential next generation telomerase inhibitors. For the year ended December 31, 2020, imetelstat was the sole development program we supported. For the imetelstat program, we incur direct external, personnel related and other research and development costs. For the years ended December 31, 2022, 2021 and 2020, direct external expenses included costs for our CROs, consultants and other clinical-related vendors, as well as expenses for contract manufacturing and quality activities. Personnel-related expenses primarily consist of salaries and wages, stock-based compensation, payroll taxes and benefits for our employees involved with

ongoing research and development efforts. Other research and development expenses primarily consist of research-related overhead associated with allocated expenses for rent and maintenance of facilities and other supplies.

Research and development expenses for the years ended December 31, 2022, 2021 and 2020 were as follows:

	Year Ended December 31,		
(In thousands)	2022	2021	2020
Direct external research and development expenses:			
Clinical program: Imetelstat	$ 65,699	$ 61,516	$ 33,838
Personnel related expenses	24,042	19,716	14,566
All other research and development expenses	5,777	4,495	3,084
Total	$ 95,518	$ 85,727	$ 51,488

The increase in research and development expenses in 2022 primarily reflects the net result of increased personnel-related expenses for additional headcount and higher consulting costs related to compilation and analysis of data for top-line results and preparations for regulatory submissions in lower risk MDS, partially offset by decreased manufacturing costs due to the timing of imetelstat manufacturing batches and reduced clinical trial expenses due to declining number of patients in IMerge Phase 3. The increase in research and development expenses in 2021 primarily reflects higher direct external costs to support the conduct of the ongoing Phase 3 clinical trials, IMerge and IMpactMF, as well as increased costs for producing validation batches at contract manufacturers to enable future production of imetelstat for clinical and potential commercial purposes. In addition, personnel-related expenses have increased in 2021 as a result of additional development and manufacturing hires.

We expect research and development expenses to remain consistent in the future as we support IMpactMF, IMproveMF and IMpress, as well as the long-term treatment and follow-up of remaining patients in IMerge Phase 3. At this time, we cannot provide reliable estimates of how much time or investment will be necessary to advance imetelstat toward commercialization. For a more complete discussion of the risks and uncertainties associated with the development of imetelstat, see the sub-sections entitled “Risks Related to the Development of Imetelstat” and “Risks Related to Regulatory Compliance Matters and Commercialization of Imetelstat” under “Risk Factors” in Part I, Item 1A and elsewhere in this annual report on Form 10-K.

General and Administrative Expenses

General and administrative expenses were $43.6 million, $29.7 million and $25.7 million for the years ended December 31, 2022, 2021 and 2020, respectively. The increase in general and administrative expenses in 2022 primarily reflects the net result of increased costs for commercial preparatory activities of approximately $3.1 million; higher personnel-related expenses of approximately $5.4 million for additional headcount; and approximately $6.2 million related to our portion of settlement costs related to the class action and derivative lawsuits, net of lower legal fees in 2022 compared to 2021; partially offset by lower consulting expenses of $1.6 million. The increase in general and administrative expenses in 2021 primarily reflects new costs in connection with pre-commercial activities, including costs of $2.8 million for modernizing our internal infrastructure to support a potential commercial launch, and higher legal costs of $1.3 million. We expect general and administrative expenses to increase in the future as the imetelstat program matures and potential commercial launch execution activities begin.

Interest Income

Interest income was $2.5 million, $527,000 and $1.8 million for the years ended December 31, 2022, 2021 and 2020, respectively. The increase in interest income in 2022 compared to 2021 primarily reflects a larger marketable securities portfolio with the receipt of net cash proceeds from the underwritten public offering completed in April 2022 and higher yields due to increasing interest rates. The decrease in interest income in 2021 compared to 2020 primarily reflects lower yields on our marketable securities portfolio due to lower interest rates. Interest earned in future periods will depend on the size of our marketable securities portfolio and prevailing interest rates.

Interest Expense

Interest expense was $6.9 million, $3.7 million and $760,000 for the years ended December 31, 2022, 2021 and 2020, respectively. The increase in interest expense primarily reflects rising interest rates and an increased principal debt balance under the Loan Agreement. Currently, we have $50.0 million in principal debt outstanding. Interest expense reflects interest owed under the Loan Agreement, as well as amortization of associated debt issuance costs and debt discounts using the effective interest method and accrual for an end of term charge.

Change in Fair Value of Equity Investment

We remeasured the fair value of our equity investment at each reporting date and any resulting change in fair value based on observable price changes was included on our consolidated statements of operations. In the first quarter of 2021, we sold our entire equity investment, resulting in a net realized gain which has been recognized in other income and expense (see below). For the year ended December 31, 2020, there was an increase in the fair value of our equity investment of $60,000, resulting from observable price changes in the equity investment. As a result of the sale of our equity investment in the first quarter of 2021, no comparable change in fair value was included on our consolidated statements of operations for the years ended December 31, 2022 or 2021.

Other Income, Net

Net other income was $1.0 million, $1.1 million and $168,000 for the years ended December 31, 2022, 2021 and 2020, respectively. In the second quarter of 2022, we recognized other income of approximately $1.3 million related to the reimbursement of certain legal expenses under our insurance policies. During the first quarter of 2021, we sold our entire equity investment resulting in a net realized gain of $1.2 million, including foreign currency translation adjustments. During the third quarter of 2020, we recognized other income of $182,000 for the share exchange of our equity investment upon its acquisition. Also included in other income were realized losses of $34,000 for the sales of our equity investment during the third quarter of 2020. See Note 2 on Fair Value Measurements – Equity Investment in Notes to Consolidated Financial Statements of this annual report on Form 10-K for additional information about the sales of our equity investment. Net other income also includes bank charges related to our cash operating accounts and marketable securities portfolio.

Liquidity and Capital Resources

As of December 31, 2022, we had cash, restricted cash, cash equivalents and marketable securities of $173.1 million, compared to $212.7 million at December 31, 2021. The decrease in cash, restricted cash, cash equivalents, and current and noncurrent marketable securities from December 31, 2021 was the net result of cash being used for operations, partially offset by the receipt of net cash proceeds of $69.9 million from our underwritten public offering completed in April 2022 and $15.2 million of cash proceeds received from the exercise of outstanding warrants in 2022.

In 2022, warrants to purchase 11,663,387 shares of our common stock were exercised for net cash proceeds of approximately $15.2 million. The warrants were issued in connection with an underwritten public offering of common stock and a pre-funded warrant, together with accompanying stock purchase warrants in May 2020.

As of December 31, 2022, we had a long-term principal debt balance of $50.0 million under the Loan Agreement with Hercules and SVB. In June 2022, we entered into a second amendment to the Loan Agreement with Hercules and SVB (or its successor, if any). Under the second amendment, the aggregate principal amount available to us increased from $75.0 million to $125.0 million. See Note 8 on Debt in Notes to Consolidated Financial Statements of this annual report on Form 10-K for additional information on the second amendment.

As of December 31, 2022, a total of $75.0 million was available to be drawn in a series of tranches under the Loan Agreement, subject to certain terms and conditions. Of this amount, $50.0 million was available subject to our achievement of certain clinical and regulatory milestones and satisfaction of certain capitalization and other requirements, and the remaining $25.0 million is available subject to approval by an investment committee comprised of Hercules and SVB. In January 2023, upon reporting of positive top-line results from IMerge Phase 3, a tranche of $20.0 million became available to be drawn for 30 days after our reporting of these clinical results. We declined to draw down this tranche due to the completion of the underwritten public offering in January 2023 noted below. As of March 9, 2023, $55.0 million remains available to be drawn under the Loan Agreement, subject to our achievement of certain clinical and regulatory milestones and satisfaction of certain capitalization and other requirements to our existing capital resources, as well as approval by an investment committee comprised of Hercules and SVB (or its successor, if any) for the final $25.0 million tranche. However, on March 10, 2023, the FDIC issued a press release stating that SVB was closed by the California Department of Financial Protection and Innovation, which appointed the FDIC as receiver. Of the remaining term commitments under the Loan Agreement, Hercules and its affiliates hold 65% and 35% were held by SVB. As a result of the closure of SVB, we do not know whether and to what extent we would be able to draw down the remaining $55.0 million under the Loan Agreement, even if we meet the conditions set forth in the Loan Agreement necessary for additional draw downs, and it is possible that we will not be able to access any additional funding under the Loan Agreement.

On January 10, 2023, we completed an underwritten public offering of 68,007,741 shares of our common stock and a pre-funded warrant to purchase 25,000,000 shares of our common stock, or the 2023 pre-funded warrant. The net cash proceeds from this offering are approximately $213.3 million, after deducting the underwriting discount and other offering expenses paid by us, and excludes any future proceeds from the exercise of the 2023 pre-funded warrant. In addition, from January 1, 2023 through March 9, 2023, we have received $59.8 million in cash proceeds from the exercise of outstanding warrants.

We have an investment policy to invest our cash in liquid, investment grade securities, such as interest-bearing money market funds, certificates of deposit, U.S. Treasury securities, municipal securities, government and agency securities, corporate notes and commercial paper. Our investment portfolio does not contain securities with exposure to sub-prime mortgages, collateralized debt obligations, asset-backed securities or auction rate securities and, to date, we have not recognized any other-than-temporary impairment charges on our marketable securities or any significant changes in aggregate fair value that would impact our cash resources or liquidity. To date, we have not experienced lack of access to our invested cash and cash equivalents; however, access to our invested cash and cash equivalents may be impacted by adverse conditions in the financial and credit markets.

On September 4, 2020, we entered into the 2020 Sales Agreement pursuant to which we may elect to issue and sell shares of our common stock having an aggregate offering price of up to $100 million in such quantities and on such minimum price terms as we set from time to time through B. Riley as our sales agent. We pay B. Riley an aggregate commission rate equal to up to 3.0% of the gross proceeds of the sales price per share for common stock sold through B. Riley under the 2020 Sales Agreement. For the year ended December 31, 2021, we sold an aggregate of 10,571,556 shares of our common stock pursuant to the 2020 Sales Agreement, resulting in net cash proceeds to us of approximately $20.4 million, after deducting sales commissions and other offering expenses payable by us. No shares of common stock were sold under the 2020 Sales Agreement for the year ended December 31, 2022. Approximately $79.1 million of our common stock remained available for issuance under the 2020 Sales Agreement as of December 31, 2022. The 2020 Sales Agreement will expire upon the earlier of: (a) the sale of all common stock subject to the 2020 Sales Agreement, or (b) September 4, 2023.

Financing Strategy

We may, from time to time, consider additional funding through a combination of new collaborative arrangements, strategic alliances, and additional equity and debt financings or from other sources. We will continue to manage our capital structure and consider all financing opportunities, whenever they may occur, that could strengthen our long-term liquidity profile. Any such capital transactions may or may not be similar to transactions in which we have engaged in the past. There can be no assurance that any such financing opportunities will be available on acceptable terms, if at all.

Future Funding Requirements

Based on our current operating plan and our expectations regarding the timing of the submission and potential acceptance and approval of our planned NDA by the FDA for imetelstat in lower risk MDS and the potential commercialization in the U.S. for the use of imetelstat in adult patients with lower risk MDS, we believe that our existing cash, cash equivalents, restricted cash and current and noncurrent marketable securities, including the net cash proceeds from our recently closed underwritten public offering in January 2023 and the cash proceeds from the exercise of warrants that we received in the January and February 2023, will be sufficient to fund our projected operating requirements through the end of the third quarter of 2025, which includes the potential U.S. commercial launch of imetelstat in lower risk MDS in the first half of 2024. In the absence of potential proceeds from exercises of currently outstanding warrants and potential drawdowns under the Loan Agreement, we will require substantial additional funding to further advance the imetelstat program, including through the completion of IMpactMF, IMproveMF and the investigator-led trial IMpress, as well as conducting the clinical, regulatory and potential commercialization activities necessary to potentially bring imetelstat to market in relapsed/refractory MF and any other future indications, and our need for additional funds may arise sooner than planned. We cannot predict with any certainty whether and to what extent the outstanding warrants will be exercised for cash, or the timing or availability of additional funds under the Loan Agreement, if at all, particularly given the recent closure of SVB by banking regulators.

In addition, our ability to commercialize imetelstat in the U.S., if regulatory approval is granted, depends on us being able to establish sales and marketing capabilities which we may be unable to do in a timely manner or at all.

Because the outcome of any clinical activities and/or regulatory approval process is highly uncertain, we cannot reasonably estimate whether any development activities we may undertake will succeed, whether we will be

able to commercialize imetelstat, and we may never recoup our investment in any imetelstat development, which would adversely affect our financial condition and our business and business prospects, and might cause us to cease operations. In addition, our plans and timing expectations could be further delayed or interrupted by macroeconomic conditions, such as if COVID-19 or pandemic conditions worsen, creating further limitations on our clinical trial or commercial preparatory activities, or if U.S. and/or international banking system fails to stabilize in light of recent and potential future bank failures, or could be disrupted by civil or political unrest or military conflicts around the world, such as the current military conflict between Ukraine and Russia. Further, our future capital requirements are difficult to forecast and will depend on many factors, including:

- the accuracy of the assumptions underlying our estimates for our capital needs;
- the scope, progress, timing, magnitude and costs of clinical development, manufacturing and potential commercialization of imetelstat, including the number of indications being pursued, subject to clearances and approvals by the FDA and similar international regulatory authorities;
- the scope, progress, duration, results and costs of current clinical trials, including IMerge Phase 3, IMpactMF, IMproveMF and IMpress, and any potential future clinical trials of imetelstat, as well as non-clinical studies and assessments of imetelstat;
- delays or disruptions in opening sites, screening and enrolling patients or treating and following patients, in IMpactMF, IMproveMF, IMpress, or any potential future clinical trials of imetelstat, whether as a result of the effects of macroeconomic conditions like the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia;
- the costs, timing and outcomes of regulatory reviews or other regulatory actions related to imetelstat, such as obtaining and maintaining regulatory clearances and approvals to continue clinical development of imetelstat in current and potential future clinical trials, as well as to commence potential commercialization of imetelstat in the U.S. and in other countries;
- the costs of preparing, filing and prosecuting patent applications and maintaining, enforcing and defending intellectual property-related claims;
- the costs of manufacturing imetelstat, including our ability to achieve any meaningful reduction in manufacturing costs;
- the costs of multiple third-party vendors and service providers, including our CROs and third-party manufacturers, to pursue the development, manufacturing and potential commercialization of imetelstat;
- our ability to establish, enforce and maintain collaborative or other strategic arrangements for research, development, clinical testing and manufacturing of imetelstat and potential future commercialization and marketing;
- our efforts to enhance operational, financial and management processes and systems that will be required for future development and commercialization of imetelstat, and our ability to successfully recruit and retain additional key personnel to support the development and potential future commercialization of imetelstat;
- our ability to successfully market and sell imetelstat, if imetelstat receives future regulatory approval or clearance, in the U.S. and other countries, and the associated costs;
- the costs and timing necessary to build a sales force in the U.S. and potentially other countries to market and sell imetelstat, should it receive regulatory approval, to the extent that such sales, marketing, manufacturing and distribution are not the responsibility of any collaborator;
- the sales price for imetelstat, if any;
- the availability of coverage and adequate third-party reimbursement for imetelstat, if any;
- the extent to which we acquire or in-license other drugs and technologies, or to which we out-license imetelstat;
- the extent to which we acquire or invest in businesses, products or technologies, although we currently have no commitments or agreements relating to any of these types of transactions;
- the extent to which we are able to enter into strategic partnerships, collaborations and alliances or licensing arrangements with third parties including for the commercialization of imetelstat in certain global regions;

- our ability to establish and maintain collaborations on favorable terms, if at all;
- the success of any collaborations that we may enter into with third parties;
- expenses associated with settlement of the pending securities class action lawsuits, and the ongoing derivative lawsuits, as well as any other potential litigation;
- the extent and scope of our general and administrative expenses, including expenses associated with potential future litigation;
- our level of indebtedness and associated debt service obligations;
- the costs of maintaining and operating facilities in California and New Jersey, telecommunications and administrative oversight, as well as higher expenses for travel;
- broader economic conditions, including inflation, rising interest rates, the prospects for recession, and recent and potential future disruptions in access to bank deposits or lending commitments due to bank failure, that may reduce our ability to access debt capital or financing on preferable terms, which may adversely affect future capital requirements and forecasts;
- the costs of enabling our personnel to work remotely, including providing supplies, equipment and technology necessary for them to perform their responsibilities; and
- the amount of proceeds, if any, of cash exercises of our currently outstanding warrants.

Until we can generate a sufficient amount of revenue from imetelstat to finance our cash requirements, which we may never achieve, we expect to finance future cash needs through a combination of public or private equity offerings, debt financings, collaborations, strategic alliances, licensing arrangements and other marketing and distribution arrangements, which may not be possible. Availability of such financing sources may be negatively impacted by any further delays in reporting results from IMpactMF or investors' perception of top-line results from IMerge Phase 3, despite our interpretation of such data being positive, as well as factors such as the global economic slowdown, inflation, rising interest rates and the prospects for recession, as well as recent and potential future disruptions in access to bank deposits or lending commitments due to bank failure.

Additional financing through public or private debt or equity financings, including pursuant to the 2020 Sales Agreement with B. Riley; the remaining tranches of up to $55.0 million available under the Loan Agreement, which are subject to the achievement of certain clinical and regulatory milestones and satisfaction of certain capitalization and other requirements, as well as approval by an investment committee comprised of Hercules and SVB (or its successor, if any) for the final $25.0 million tranche; capital lease transactions or other financing sources, may not be available on acceptable terms, or at all. We may be unable to raise equity capital, or may be forced to do so at a stock price or on other terms that could result in substantial dilution of ownership for our stockholders. The receptivity of the public and private debt and equity markets to proposed financings has been substantially affected by uncertainty in the general economic, market and political climate due to the effects of macroeconomic conditions like the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates, prospects of a recession or recent and potential future disruptions in access to bank deposits or lending commitments due to bank failure, and may in the future be affected by other factors which are unpredictable and over which we have no control. In this regard, the effects of the COVID-19 pandemic have increased market volatility and could result in a significant long-term disruption of global financial markets, which could reduce or eliminate our ability to raise additional funds through financings, and could negatively impact the terms upon which we may raise those funds. Similarly, these macroeconomic conditions have created extreme volatility and disruption in the capital markets and is expected to have further global economic consequences. If the equity and credit markets deteriorate, including as a result of macroeconomic conditions like the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates, prospects of a recession or recent and potential future disruptions in access to bank deposits or lending commitments due to bank failure, it may make any necessary debt or equity financing more difficult to obtain in a timely manner or on favorable terms, more costly or more dilutive. If we are unable to raise additional capital or establish alternative collaborative arrangements with third-party collaborative partners for imetelstat, the development and potential commercialization of imetelstat may be further delayed, altered or abandoned, which might cause us to cease operations.

In addition, we may seek additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. Due to uncertainty in the general economic, market and political climate, we may determine that it is necessary or appropriate to raise additional funds proactively to meet longer-term anticipated operating plans. To the extent that we raise additional capital through the sale of equity or convertible debt securities, including pursuant to the 2020 Sales Agreement, your

ownership interest as a stockholder may be diluted, and the terms may include liquidation or other preferences that materially and adversely affect your rights as a stockholder. In addition, we have borrowed, and in the future may borrow, additional capital from institutional and commercial banking sources to fund imetelstat development and our future growth, including pursuant to our Loan Agreement or potentially pursuant to new arrangements with different lenders. We may borrow funds on terms under agreements, such as the Loan Agreement, that include restrictive covenants, including covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. Moreover, if we raise additional funds through alliance, collaborative or licensing arrangements with third parties, we may have to relinquish valuable rights to imetelstat or our technologies or grant licenses on terms that are not favorable to us.

We cannot assure you that our existing capital resources, including net cash proceeds from our recent underwritten public offering in January 2023, future interest income, future proceeds from potential cash exercises of currently outstanding warrants and potential future sales of our common stock, including under the 2020 Sales Agreement with B. Riley or potential future drawdowns, if available, of the remaining up to $55.0 million under the Loan Agreement (which are subject to the achievement of certain clinical and regulatory milestones and satisfaction of certain capitalization and other requirements, as well as approval by an investment committee comprised of Hercules and SVB (or its successor, if any) for the final $25.0 million tranche), will be sufficient to fund our operating plans. In this regard, on March 10, 2023, the FDIC issued a press release stating that SVB was closed by the California Department of Financial Protection and Innovation, which appointed the FDIC as receiver. Of the remaining term commitments under the Loan Agreement, Hercules and its affiliates hold 65% and 35% were held by SVB. As a result of the closure of SVB, we do not know whether Hercules and SVB's successor, if any, will fund their respective portions of the remaining term commitments or whether and to what extent we will otherwise be able to draw down the remaining $55.0 million under the Loan Agreement, even if we meet the conditions set forth in the Loan Agreement necessary for additional draw downs, and it is possible that we will not be able to access any additional funding under the Loan Agreement, which would require us obtain additional or alternative financing to advance our development of imetelstat. Moreover, while we did not hold cash deposits or securities at SVB, if other banks and financial institutions enter receivership, become insolvent or otherwise fail in the future in response to financial conditions affecting the banking system and financial markets or otherwise, our ability to access our existing cash, cash equivalents and marketable securities may be delayed or precluded, which could have a material adverse effect on our business, business prospects and financial position.

Cash Flows from Operating Activities

Net cash used in operating activities was $127.4 million, $95.6 million and $66.7 million in 2022, 2021 and 2020, respectively. The increase in net cash used in operating activities in 2022 and 2021 primarily reflects higher payments for research and development expenses in connection with supporting the clinical trials, IMerge Phase 3, IMpactMF, IMproveMF and IMpress, and increases in headcount.

Cash Flows from Investing Activities

Net cash provided by investing activities in 2022 and 2021 was $62.1 million and $71.9 million, respectively. Net cash used in investing activities in 2020 was $105.3 million. Net cash provided by investing activities in 2022 and 2021 primarily reflects a higher rate of maturities than purchases of marketable securities. Net cash used in investing activities in 2020 primarily reflects a higher rate of purchases than maturities of marketable securities resulting from the investment of net cash proceeds from the underwritten public offering completed in 2020.

For the three years ended December 31, 2022, we purchased approximately $1.0 million in property and equipment, none of which was financed through equipment financing arrangements.

Cash Flows from Financing Activities

Net cash provided by financing activities in 2022, 2021 and 2020 was $87.3 million, $48.6 million and $168.3 million, respectively. Financing activities in 2022, 2021 and 2020 primarily reflect the receipt of net cash proceeds of $69.9 million from the underwritten public offering of common stock, pre-funded warrant and stock purchase warrants completed in April 2022, cash proceeds from the exercise of warrants, receipt of net cash proceeds from the sales of our common stock under the 2020 Sales Agreement in 2021, the receipt of $140.2 million in net cash proceeds from the underwritten public offering of common stock, pre-funded warrant and stock purchase warrants in May 2020, receipt of net cash proceeds from the sales of our common stock under the 2018 Sales Agreement with B. Riley in 2020 and aggregate drawdowns of $25.0 million in each of 2021 and 2020 under the Loan Agreement with Hercules and SVB.

Contractual Obligations

We have entered into arrangements that contractually obligate us to make payments that will affect our liquidity and cash flows in future periods. Our contractual obligations primarily consist of our obligations under non-cancellable operating leases. The aggregate amount of future operating lease payments over the term of our leases is $4.6 million as of December 31, 2022. For additional information on our leases and timing of future payments, see Note 7 on Operating Leases in Notes to Consolidated Financial Statements of this annual report on Form 10-K.

In the normal course of business, we enter into agreements with CROs for clinical trials and CMOs for clinical supply manufacturing and with other vendors for preclinical research studies, investigator-led trials and other services and products for operating purposes. We have not considered these payments to be contractual obligations since the contracts are generally cancelable at any time by us upon less than 180 days' prior written notice. We also have certain in-license agreements that require us to pay milestones to such third parties upon achievement of certain development, regulatory or commercial milestones. Amounts related to contingent milestone payments are not considered contractual obligations as they are contingent on the successful achievement of certain development, regulatory approval and commercial milestones, which may not be achieved.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We are a smaller reporting company as defined by Rule 12b-2 of the Securities Exchange Act of 1934, as amended, or the Exchange Act, and are not required to provide the information specified under this item.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The following financial statements and the related notes thereto, of Geron Corporation and the Report of Independent Registered Public Accounting Firm, Ernst & Young LLP, are filed as a part of this annual report on Form 10-K.

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Geron Corporation

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Geron Corporation (the Company) as of December 31, 2022 and 2021, the related consolidated statements of operations, comprehensive loss, stockholders' equity and cash flows for each of the three years in the period ended December 31, 2022, and the related notes (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company’s financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of the critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Accounting for accrued clinical trial expenses

Description of the Matter	The Company recorded research and development expenses of $95.5 million for the year ended December 31, 2022. As described in Note 1, research and development expenses are expensed as incurred. Research and development expenses include fees paid to contract research organizations ("CROs"), and other vendors, that conduct certain research and development activities on behalf of the Company. Accrued expenses for clinical trial activities performed by CROs are based upon the estimated amount of work completed on each trial. For clinical trial expenses and related expenses associated with the conduct of clinical trials, the significant factors used in estimating accruals include the number of patients enrolled, the number of active clinical sites, the activities conducted by each clinical site, and the duration and level of activities for each patient in the trial. The Company monitors patient enrollment levels and related activities to the extent possible through internal reviews, review of contractual terms and correspondence with CROs. The accrued expense estimates are based on the best information available. Auditing the accounting for accrued clinical trial expenses is complex because of the high volume of data used in management's estimates, the assumptions used by management to develop their estimates and the extensive verification to determine the costs incurred and extent of the services performed by CROs and other vendors during the reporting period and as of the balance sheet date.
How We Addressed the Matter in Our Audit	To test the Company's accounting for accrued clinical trial expenses, our audit procedures included, among others, obtaining supporting evidence from third parties of the research and development activities performed for significant clinical trials and testing the accuracy and completeness of the inputs used in management's analyses to determine the costs incurred. We inspected key terms, timelines of completion, activities and costs for a sample of vendor contracts, including amendments, and compared these to management's analyses used in tracking the progress of service agreements. We met with internal clinical personnel to understand the status of significant clinical trial activities. We also tested a sample of subsequent payments by agreeing the invoice to the original accrual and the invoice payments to bank statements.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 1992.
San Jose, California
March 16, 2023

GERON CORPORATION

CONSOLIDATED BALANCE SHEETS

	December 31, 2022	December 31, 2021
	(In thousands, except share and per share data)	
ASSETS		
Current assets:		
Cash and cash equivalents	$ 56,845	$ 34,871
Restricted cash	364	364
Marketable securities	115,901	148,851
Interest and other receivables	3,144	1,763
Prepaid and other current assets	3,992	1,357
Total current assets	180,246	187,206
Noncurrent marketable securities	—	28,651
Property and equipment, net	793	650
Operating leases, right-of-use assets	4,147	4,727
Deposits and other assets	5,389	4,800
	$ 190,575	$ 226,034
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 10,190	$ 6,687
Accrued compensation and benefits	11,534	8,099
Operating lease liabilities	925	901
Debt	20,945	—
Accrued liabilities	33,100	29,834
Total current liabilities	76,694	45,521
Noncurrent operating lease liabilities	3,671	4,267
Noncurrent debt	30,212	49,830
Total liabilities	110,577	99,618
Commitments and contingencies		
Stockholders' equity:		
Preferred stock, $0.001 par value; 3,000,000 shares authorized; no shares issued and outstanding at December 31, 2022 and 2021	—	—
Common stock, $0.001 par value; 675,000,000 shares authorized; 390,262,524 and 323,731,591 shares issued and outstanding at December 31, 2022 and 2021, respectively	390	324
Additional paid-in capital	1,493,469	1,398,006
Accumulated deficit	(1,413,642)	(1,271,741)
Accumulated other comprehensive loss	(219)	(173)
Total stockholders' equity	79,998	126,416
	$ 190,575	$ 226,034

See accompanying notes.

GERON CORPORATION

CONSOLIDATED STATEMENTS OF OPERATIONS

	Year Ended December 31,		
	2022	2021	2020
	(In thousands, except share and per share data)		
Revenues:			
License fees and royalties	$ 596	$ 1,393	$ 253
Operating expenses:			
Research and development	95,518	85,727	51,488
General and administrative	43,628	29,665	25,678
Total operating expenses	139,146	115,392	77,166
Loss from operations	(138,550)	(113,999)	(76,913)
Interest income	2,529	527	1,828
Interest expense	(6,882)	(3,740)	(760)
Change in fair value of equity investment	—	—	60
Other income, net	1,002	1,100	168
Net loss	$ (141,901)	$ (116,112)	$ (75,617)
Basic and diluted net loss per share	$ (0.37)	$ (0.35)	$ (0.28)
Shares used in computing basic and diluted net loss per share	380,784,846	327,631,814	271,460,265

See accompanying notes.

GERON CORPORATION

STATEMENTS OF COMPREHENSIVE LOSS

	Year Ended December 31,		
	2022	2021	2020
		(In thousands)	
Net loss	$ (141,901)	$ (116,112)	$ (75,617)
Net unrealized loss on marketable securities	(68)	(251)	(54)
Foreign currency translation adjustments	22	—	—
Comprehensive loss	$ (141,947)	$ (116,363)	$ (75,671)

See accompanying notes.

GERON CORPORATION

CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY

	Common Stock		Additional Paid-In	Accumulated	Accumulated Other Comprehensive	Total Stockholders'
	Shares	Amount	Capital	Deficit	Gain (Loss)	Equity
			(In thousands, except share data)			
Balances at December 31, 2019	199,814,581	$ 200	$ 1,214,835	$ (1,080,012)	$ 132	135,155
Net loss	—	—	—	(75,617)	—	(75,617)
Other comprehensive loss	—	—	—	—	(54)	(54)
Issuance of common stock, pre-funded warrant and warrants to purchase common stock in public offering, net of issuance costs of $9,808	107,049,375	107	140,077	—	—	140,184
Issuance of common stock in connection with at market offering, net of issuance costs of $144	3,496,616	3	4,072	—	—	4,075
Issuance of common stock in connection with exercise of warrants	12,500	—	16	—	—	16
Stock-based compensation related to issuance of common stock and options in exchange for services	17,986	—	85	—	—	85
Issuances of common stock under equity plans	175,795	—	208	—	—	208
Stock-based compensation for equity-based awards to employees and directors	—	—	6,895	—	—	6,895
Balances at December 31, 2020	310,566,853	310	1,366,188	(1,155,629)	78	210,947
Net loss	—	—	—	(116,112)	—	(116,112)
Other comprehensive loss	—	—	—	—	(251)	(251)
Issuance of common stock in connection with at market offering, net of issuance costs of $470	10,571,556	11	20,374	—	—	20,385
Issuance of common stock in connection with exercise of warrants	1,906,341	2	2,477	—	—	2,479
Stock-based compensation related to issuance of common stock and options in exchange for services	20,783	—	91	—	—	91
Issuances of common stock under equity plans	666,058	1	796	—	—	797
Stock-based compensation for equity-based awards to employees and directors	—	—	8,080	—	—	8,080
Balances at December 31, 2021	323,731,591	324	1,398,006	(1,271,741)	(173)	126,416
Net loss	—	—	—	(141,901)	—	(141,901)
Other comprehensive loss	—	—	—	—	(68)	(68)
Foreign currency translation adjustment	—	—	—	—	22	22
Issuance of common stock, pre-funded warrant and warrants to purchase common stock in public offering, net of issuance costs of $5,066	53,333,334	53	69,863	—	—	69,916
Issuance of common stock in connection with exercise of warrants	11,663,387	12	15,151	—	—	15,163
Stock-based compensation related to issuance of common stock and options in exchange for services	15,962	—	264	—	—	264
Issuances of common stock under equity plans	1,518,250	1	2,184	—	—	2,185
Stock-based compensation for equity-based awards to employees and directors	—	—	8,001	—	—	8,001
Balances at December 31, 2022	390,262,524	$ 390	$ 1,493,469	$ (1,413,642)	$ (219)	$ 79,998

See accompanying notes.

GERON CORPORATION

CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year Ended December 31,		
	2022	2021	2020
		(In thousands)	
Cash flows from operating activities:			
Net loss	$ (141,901)	$ (116,112)	$ (75,617)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization	288	215	158
Accretion and amortization on investments, net	(965)	1,424	818
Amortization of debt issuance costs/debt discount	1,327	893	179
Gain on sales of available for sale securities	—	—	(19)
Net gain on exchange and sales of equity investment	—	(1,233)	(148)
Change in fair value of equity investment, including foreign currency translation	—	—	(163)
Stock-based compensation for services by non-employees	264	91	85
Stock-based compensation for employees and directors	8,001	8,080	6,895
Amortization of right-of-use assets	580	568	777
Changes in assets and liabilities:			
Interest and other receivables	(1,381)	(1,041)	80
Prepaid and other current assets	(2,630)	1,317	(1,286)
Deposit and other assets	(594)	(3,807)	(206)
Accounts payable	3,503	(232)	5,731
Accrued compensation and benefits	3,435	(119)	3,388
Amount due to Janssen Biotech, Inc.	—	—	(14,269)
Accrued liabilities	3,266	14,909	7,397
Operating lease liabilities	(572)	(509)	(452)
Net cash used in operating activities	(127,379)	(95,556)	(66,652)
Cash flows from investing activities:			
Purchases of property and equipment	(431)	(207)	(401)
Purchases of marketable securities	(258,007)	(177,434)	(313,201)
Proceeds from sales of securities available for sale	—	—	7,681
Proceeds from maturities of marketable securities	320,505	247,994	200,262
Proceeds from sales of equity investment	—	1,594	339
Net cash provided by (used in) investing activities	62,067	71,947	(105,320)
Cash flows from financing activities:			
Proceeds from issuances of common stock from equity plans	2,185	797	208
Proceeds from issuance of common stock and warrants in public offering, net of paid issuance costs	69,916	—	140,184
Proceeds from issuances of common stock from at market offerings, net of paid issuance costs	—	20,385	4,075
Proceeds from exercise of warrants	15,163	2,479	16
Proceeds from debt financing, net of paid debt issuance costs and debt discounts	—	24,895	23,863
Net cash provided by financing activities	87,264	48,556	168,346
Net effect of exchange rates on cash, cash equivalents and restricted cash	22	—	—
Net increase (decrease) in cash, cash equivalents and restricted cash	21,974	24,947	(3,626)
Cash, cash equivalents and restricted cash at the beginning of the period	35,235	10,288	13,914
Cash, cash equivalents and restricted cash at the end of the period	$ 57,209	$ 35,235	$ 10,288

See accompanying notes.

1. ORGANIZATION AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Organization

The terms “Geron”, the “Company”, “we” and “us” as used in this report refer to Geron Corporation. Geron was incorporated in the State of Delaware on November 28, 1990. We are a late-stage clinical biopharmaceutical company that is focused on the development and potential commercialization of imetelstat, an innovative therapeutic for hematologic malignancies. We have global rights to imetelstat, a first in class telomerase inhibitor, which was discovered and developed at Geron. Principal activities to date have included obtaining financing, securing operating facilities and conducting research and development.

Principles of Consolidation

The consolidated financial statements include the accounts of Geron and our wholly-owned subsidiary, Geron UK Limited, or Geron UK, a United Kingdom company. Geron UK was incorporated in September 2021, and its operations commenced in January 2022. We have eliminated intercompany accounts and transactions. We prepare the financial statements of Geron UK using the local currency as the functional currency. We translate the assets and liabilities of Geron UK at rates of exchange at the balance sheet date and translate income and expense items at average monthly rates of exchange. The resultant translation adjustments are included in accumulated other comprehensive income (loss), a separate component of stockholders’ equity, on our consolidated balance sheets.

Net Loss Per Share

Basic net income (loss) per share is calculated by dividing net income (loss) by the weighted-average number of shares of common stock outstanding for the periods presented without consideration of potential common shares. In April 2022, we entered into an underwriting agreement in connection with a public offering of our common stock, pursuant to which we issued a pre-funded warrant to purchase 18,095,238 shares of our common stock, also known as the 2022 pre-funded warrant, together with accompanying warrants to purchase shares of our common stock. In May 2020, we entered into an underwriting agreement in connection with a public offering of our common stock, pursuant to which we issued a pre-funded warrant to purchase 8,335,239 shares of our common stock, or the 2020 pre-funded warrant, together with accompanying warrants to purchase shares of our common stock. The 2022 pre-funded warrant and 2020 pre-funded warrant each are exercisable immediately at an exercise price of $0.001 per share. We included the 2022 pre-funded warrant and 2020 pre-funded warrant in the computation of basic net loss per share, as applicable, since their exercise price is negligible, and they may be exercised at any time. See Note 9 on Stockholders' Equity for further discussion of the April 2022 public offering.

Diluted net income per share would be calculated by adjusting the weighted-average number of shares of common stock outstanding for the dilutive effect of additional shares of common stock that would have been outstanding if potentially dilutive securities had been issued, as determined using the treasury-stock method. Potential dilutive securities consist of outstanding stock options and warrants to purchase our common stock. Diluted net loss per share excludes potential dilutive securities for all periods presented as their effect would be anti-dilutive. Accordingly, basic and diluted net loss per share is the same for all periods presented in the accompanying consolidated statements of operations. Since we incurred a net loss for 2022, 2021, and 2020, the diluted net loss per share calculation excludes potential dilutive securities of 145,726,765, 105,725,875 and 101,881,391 shares, respectively, related to outstanding stock options and warrants as their effect would have been anti-dilutive.

Use of Estimates

The accompanying consolidated financial statements have been prepared in accordance with generally accepted accounting principles in the United States, or U.S. GAAP. The preparation of financial statements in conformity with U.S. GAAP requires us to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities as of the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. On an ongoing basis, we evaluate our estimates, including those related to accrued liabilities, revenue recognition, fair value of marketable securities and equity investments, operating leases, right-of-use assets, lease liabilities, income taxes, and stock-based compensation. We base our estimates on historical experience and on various other market specific and relevant assumptions that we believe to be reasonable under the circumstances. Actual results could differ from those estimates.

Fair Value of Financial Instruments

Cash Equivalents and Marketable Securities

We consider all highly liquid investments with an original maturity of three months or less to be cash equivalents. We are subject to credit risk related to our cash equivalents and marketable securities. Our marketable debt securities include U.S. Treasury securities, municipal securities, government-sponsored enterprise securities, commercial paper and corporate notes.

We classify our marketable debt securities as available for sale. We record available for sale debt securities at fair value with unrealized gains and losses reported in accumulated other comprehensive income (loss) in stockholders' equity. Realized gains and losses are included in interest income and are derived using the specific identification method for determining the cost of securities sold and have been insignificant to date. Dividend and interest income are recognized when earned and included in interest income on our consolidated statements of operations. We recognize a charge when the declines in the fair values below the amortized cost bases of our available for sale securities are judged to be other than temporary. We consider various factors in determining whether to recognize an other than temporary charge, including whether we intend to sell the security or whether it is more likely than not that we would be required to sell the security before recovery of the amortized cost basis. Declines in market value judged as other than temporary result in a charge to interest income. We have not recorded any other-than-temporary impairment charges on our available-for-sale securities for the years ended December 31, 2022, 2021 and 2020. See Note 2 on Fair Value Measurements.

Equity Investments

We measure our investment in equity securities at fair value at each reporting date. Changes in fair value resulting from observable price changes are included in change in fair value of equity investment and changes in fair value resulting from foreign currency translation are included in other expense on our consolidated statements of operations.

Leases

At the inception of an arrangement, we determine whether the arrangement is or contains a lease based on the unique facts and circumstances present. Operating leases are included in operating leases, right-of-use assets and lease liabilities on our consolidated balance sheets. Right-of-use assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. Operating lease liabilities and their corresponding right-of-use assets are recorded based on the present value of remaining lease payments over the expected lease term. The present value of remaining lease payments within the 12 months following the balance sheet date are classified as current lease liabilities. The present value of lease payments not within the 12 months following the balance sheet date are classified as noncurrent lease liabilities. The interest rate implicit in lease contracts is typically not readily determinable. As such, to calculate the net present value of lease payments, we apply our incremental borrowing rate, which is the estimated rate to borrow on a collateralized basis over a similar term an amount equal to the lease payments in a similar economic environment as of the lease commencement date. We may adjust the right-of-use assets for certain adjustments, such as initial direct costs paid or incentives received. In addition, we include any options to extend or terminate the lease in the expected lease term when it is reasonably certain that we will exercise any such option. Lease expense is recognized on a straight-line basis over the expected lease term.

For lease agreements entered into after January 1, 2019 that include lease and non-lease components, such components are generally accounted for separately. We have also elected not to recognize on our consolidated balance sheets leases with terms of one year or less.

Debt Issuance Costs and Debt Discounts

Debt issuance costs include legal fees, accounting fees, and other direct costs incurred in connection with the execution of our debt financing. Debt discounts represent costs paid to the lenders. Debt issuance costs and debt discounts are deducted from the carrying amount of the debt liability and are amortized to interest expense over the term of the related debt using the effective interest method.

Revenue Recognition

We recognize revenue in accordance with the provisions of Accounting Standards Codification Topic 606, Revenue from Contracts with Customers, or Topic 606. In determining the appropriate amount and timing of revenue to be recognized under this guidance, we perform the following five steps: (i) identify the contract(s) with our customer; (ii) identify the promised goods or services in the agreement and determine whether they are performance obligations, including whether they are distinct in the context of the agreement; (iii) measure the transaction price, including the constraint on variable consideration; (iv) allocate the transaction price to the performance obligations based on stand-alone selling prices; and (v) recognize revenue when (or as) we satisfy each performance obligation.

A performance obligation is a promise in an agreement to transfer a distinct good or service to the customer and is the unit of account in Topic 606. Significant management judgment is required to determine the level of effort required and the period over which completion of the performance obligations is expected under an agreement. If reasonable estimates regarding when performance obligations are either complete or substantially complete cannot be made, then revenue recognition is deferred until a reasonable estimate can be made. Revenue is then recognized over the remaining estimated period of performance using the cumulative catch-up method.

We allocate the total transaction price to each performance obligation based on the estimated relative stand-alone selling prices of the promised goods or services underlying each performance obligation. Estimated selling prices for license rights are calculated using an income approach model and include the following key assumptions, judgments and estimates: the development timeline, revenue forecast, commercialization expenses, discount rate and probabilities of technical and regulatory success.

Following is a description of the principal activities from which we generate revenue. License fees and royalty revenue primarily represent amounts earned under agreements that out-license our technology to various companies.

License Agreements

We previously entered into several license agreements with various oncology, diagnostics, research tools and biologics production companies, whereby we granted certain rights to our non-imetelstat related technologies. Under these agreements, non-refundable upfront fees and annual license maintenance fees were considered fixed consideration, while milestone payments and royalties were identified as variable consideration. Since June 30, 2021, no active license agreements remain. The license related to our specialized oligonucleotide backbone chemistry, as well as patent rights covering the synthesis of monomers, the building blocks of oligonucleotides, terminated effective April 2021.

In connection with the divestiture of Geron's human embryonic stem cell assets, including intellectual property and proprietary technology, to Lineage Cell Therapeutics, Inc. (formerly BioTime, Inc. which acquired Asterias Biotherapeutics, Inc.) in 2013, we are entitled to receive royalties on sales of certain research or commercial products utilizing Geron's divested intellectual property.

Licenses of Intellectual Property. If we determine the license to intellectual property is distinct from the other performance obligations identified in the agreement and the licensee can use and benefit from the license, we recognize revenue from non-refundable upfront fees allocated to the license upon the completion of the transfer of the license to the licensee. For such licenses, we recognize revenue from annual license maintenance fees upon the start of the new license period. For licenses that are bundled with other performance obligations, we assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress for purposes of recognizing revenue from non-refundable upfront fees or annual license maintenance fees. At each reporting date, we reassess the progress and, if necessary, adjust the measure of performance and related revenue recognition.

Milestone Payments. At the inception of each agreement that includes milestone payments, we evaluate whether the milestones are considered probable of being achieved and estimate the amount to be included in the transaction price using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the value of the associated milestone is included in the transaction price. For milestones that we do not deem to be probable of being achieved, the associated milestone payments are fully constrained and the value of the

milestone is excluded from the transaction price with no revenue being recognized. For example, milestone payments that are not within our control, such as regulatory-related accomplishments, are not considered probable of being achieved until those accomplishments have been communicated by the relevant regulatory authority. Once the assessment of probability of achievement becomes probable, we recognize revenue for the milestone payment. At each reporting date, we assess the probability of achievement of each milestone under any current agreements.

Royalties. For agreements with sales-based royalties, including milestone payments based on the level of sales, where the license is deemed to be the predominant item to which the royalties relate, we recognize revenue at the later of (a) when the related sales occur, or (b) when the performance obligation, to which some or all of the royalty has been allocated, has been satisfied (or partially satisfied). At each reporting date, we estimate the sales incurred by each licensee during the reporting period based on historical experience and accrue the associated royalty amount.

Restricted Cash

Restricted cash consists of funds maintained in separate money market or certificate of deposit accounts for credit card purchases.

Research and Development Expenses

Research and development expenses currently consist of expenses incurred in developing and testing imetelstat and research related to potential next generation telomerase inhibitors. These expenses include, but are not limited to, payroll and personnel expense, lab supplies, non-clinical studies, clinical trials, including support for investigator-led clinical trials, raw materials to manufacture clinical trial drugs, manufacturing costs for research and clinical trial materials, sponsored research at other labs, consulting, costs to maintain technology licenses and research-related overhead.

Our current imetelstat clinical trials are being supported by contract research organizations, or CROs, and other vendors. We accrue expenses for clinical trial activities performed by CROs based upon the estimated amount of work completed on each trial. For clinical trial expenses and related expenses associated with the conduct of clinical trials, the significant factors used in estimating accruals include the number of patients enrolled, the number of active clinical sites, and the duration for which the patients have been enrolled in the trial. We monitor patient enrollment levels and related activities to the extent possible through internal reviews, review of contractual terms and correspondence with CROs. We base our estimates on the best information available at the time. However, additional information may become available to us which will allow us to make a more accurate estimate in future periods. In that event, we may be required to record adjustments to research and development expenses in future periods when the actual level of activity becomes more certain.

Depreciation and Amortization

We record property and equipment at cost and calculate depreciation using the straight-line method over the estimated useful lives of the assets, generally four years. Leasehold improvements are amortized over the shorter of the estimated useful life or remaining term of the lease.

Stock-Based Compensation

We maintain various stock incentive plans under which stock options and restricted stock awards can be granted to employees, non-employee directors and consultants. We also have an employee stock purchase plan for all eligible employees. We recognize stock-based compensation expense based on grant-date fair values of service-based stock options on a straight-line basis over the requisite service period, which is generally the vesting period. For performance-based stock options with vesting based on the achievement of certain strategic milestones, stock-based compensation expense is recognized over the period from the date the performance condition is determined to be probable of occurring through the date the applicable condition is expected to be met and is reduced for estimated forfeitures, as applicable. If the performance condition is not considered probable of being achieved, no stock-based compensation expense is recognized until such time as the performance condition is considered probable of being met, if at all. If the assessment of probability of the performance condition changes, the impact of the change in estimate would be recognized in the period of the change. The determination of grant-date fair values for our service-based and performance-based stock options and employee stock purchases using the Black Scholes option pricing model is affected by our stock price as well as assumptions regarding a number of complex and subjective

variables. The grant-date fair value for service-based restricted stock awards is determined using the fair value of our common stock on the date of grant. We evaluate whether an adjustment to the assumptions of fair value of our common stock and historical volatility are required if observed prices of our common stock materially differ from historical information.

We measure share-based payments to non-employees based on the grant-date fair value of the equity awards to be issued. We recognize stock-based compensation expense for the fair value of the vested portion of non-employee stock-based awards on our consolidated statements of operations. For additional information, see Note 9 on Stockholders' Equity.

Accumulated Other Comprehensive Gain (Loss)

Accumulated other comprehensive gain (loss) includes certain changes in stockholders' equity which are excluded from net income (loss). Accumulated other comprehensive loss on our consolidated balance sheets as of December 31, 2022 and 2021, respectively, is comprised of net unrealized losses on marketable securities and cumulative translation adjustments.

Income Taxes

We maintain deferred tax assets and liabilities that reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes and are subject to tests of recoverability. Our deferred tax assets include net operating loss carryforwards, federal and state tax credits and capitalized research and development. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. Our net deferred tax asset has been fully offset by a valuation allowance because of our history of losses. Any potential accrued interest and penalties related to unrecognized tax benefits would be recorded as income tax expense.

Segment Information

Our executive management team represents our chief decision maker. We view our operations as a single segment, the development of therapeutic products for oncology. As a result, the financial information disclosed herein materially represents all of the financial information related to our principal operating segment.

Recent Accounting Pronouncements

New Accounting Pronouncements – Issued But Not Yet Adopted

In June 2016, the FASB issued ASU 2016-13, *Measurement of Credit Losses on Financial Instruments*, or ASU 2016-13. The main objective of ASU 2016-13 is to provide financial statement users with more decision-useful information about an entity's expected credit losses on financial instruments and other commitments to extend credit at each reporting date. To achieve this objective, the amendments in this update replace the incurred loss impairment methodology currently used today with a methodology that reflects expected credit losses and requires consideration of a broader range of reasonable and supportable information to develop credit loss estimates. Subsequent to issuing ASU 2016-13, the FASB issued ASU 2018-19, *Codification Improvements to Topic 326, Financial Instruments – Credit Losses*, or ASU 2018-19, for the purpose of clarifying certain aspects of ASU 2016-13. In May 2019, the FASB issued ASU 2019-05, *Financial Instruments – Credit Losses (Topic 326): Targeted Transition Relief*, or ASU 2019-05, to provide entities with more flexibility in applying the fair value option on adoption of the credit impairment standard. In November 2019, the FASB issued ASU 2019-11, *Codification Improvements to Topic 326, Financial Instruments – Credit Losses*, which expands the scope of the practical expedient that allows entities to exclude the accrued interest component of amortized cost from various disclosure. Entities that elect to apply the practical expedient must disclose the total amount of accrued interest that they exclude from their disclosures of amortized cost. ASU 2018-19, ASU 2019-05 and ASU 2019-11 have the same effective date and transition requirements as ASU 2016-13. ASU 2016-13 will be effective for fiscal years beginning after December 15, 2022, using a modified retrospective approach, for smaller reporting companies. Early adoption is permitted. We plan to adopt ASU 2016-13 and related updates as of January 1, 2023. We do not expect the adoption of this standard to have a material impact on our financial statements.

In August 2020, the FASB issued ASU 2020-06, *Accounting for Convertible Instruments and Contracts in an Entity's Own Equity*, or ASU 2020-06. The key elements of ASU 2020-06 aim to reduce unnecessary complexity in GAAP for certain financial instruments with characteristics of liabilities and equity. In addressing the complexity, the FASB focused on amending the guidance on convertible instruments and the guidance on the derivatives scope exception for contracts in an entity's own equity. For convertible instruments, the FASB decided to reduce the number of accounting models for convertible debt instruments and convertible preferred stock. For contracts in an entity's own equity, the FASB observed that the application of the derivatives scope exception guidance results in accounting for some contracts as derivatives while accounting for economically similar contracts as equity. The FASB also decided to improve and amend the related earnings per share guidance. ASU 2020-06 is effective for fiscal years beginning after December 15, 2021, and interim periods within those fiscal years for public business entities that are not smaller reporting companies. For all other entities, ASU 2020-06 is effective for fiscal years beginning after December 15, 2023, and interim periods within those fiscal years. We plan to adopt ASU 2020-06 as of January 1, 2024. We do not expect the adoption of this standard to have a material impact on our financial statements.

Other recent accounting pronouncements issued by the FASB did not or are not believed by management to have a material impact on our financial statements.

2. FAIR VALUE MEASUREMENTS

Cash Equivalents and Marketable Securities

Cash equivalents, restricted cash and marketable securities by security type at December 31, 2022 were as follows:

(In thousands)	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
Included in cash and cash equivalents:				
Money market funds	$ 39,771	$ —	$ —	$ 39,771
	$ 39,771	$ —	$ —	$ 39,771
Restricted cash:				
Money market fund	$ 93	$ —	$ —	$ 93
Certificate of deposit	271	—	—	271
	$ 364	$ —	$ —	$ 364
Marketable securities:				
U.S. Treasury securities (due in less than one year)	$ 12,983	$ —	$ (62)	$ 12,921
Municipal securities (due in less than one year)	3,000	—	(24)	2,976
Government-sponsored enterprise securities (due in less than one year)	9,860	—	(14)	9,846
Commercial paper (due in less than one year)	64,285	6	(92)	64,199
Corporate notes (due in less than one year)	26,014	—	(55)	25,959
	$ 116,142	$ 6	$ (247)	$ 115,901

Cash equivalents, restricted cash and marketable securities by security type at December 31, 2021 were as follows:

(In thousands)	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
Included in cash and cash equivalents:				
Money market funds	$ 24,207	$ —	$ —	$ 24,207
Commercial paper	7,499	—	—	7,499
	$ 31,706	$ —	$ —	$ 31,706
Restricted cash:				
Money market fund	$ 93	$ —	$ —	$ 93
Certificate of deposit	271	—	—	271
	$ 364	$ —	$ —	$ 364
Marketable securities:				
U.S. Treasury securities (due in less than one year)	$ 15,585	$ —	$ (18)	$ 15,567
U.S. Treasury securities (due in one to two years)	1,524	—	(3)	1,521
Municipal securities (due in one to two years)	3,000	—	(15)	2,985
Government-sponsored enterprise securities (due in less than one year)	12,500	—	(7)	12,493
Commercial paper (due in less than one year)	84,398	2	(38)	84,362
Corporate notes (due in less than one year)	36,444	2	(17)	36,429
Corporate notes (due in one to two years)	24,224	—	(79)	24,145
	$ 177,675	$ 4	$ (177)	$ 177,502

Cash equivalents and marketable securities with unrealized losses that have been in a continuous unrealized loss position for less than 12 months and 12 months or longer at December 31, 2022 and 2021 were as follows:

	Less Than 12 Months		12 Months or Greater		Total	
(In thousands)	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses
As of December 31, 2022:						
U.S. Treasury securities (due in less than one year)	$ 11,424	$ (57)	$ 1,497	$ (5)	$ 12,921	$ (62)
Municipal securities (due in less than a year)	—	—	2,976	(24)	2,976	(24)
Government-sponsored enterprise securities (due in less than one year)	9,845	(14)	—	—	9,845	(14)
Commercial paper (due in less than one year)	52,454	(92)	—	—	52,454	(92)
Corporate notes (due in less than one year)	1,998	(2)	23,962	(53)	25,960	(55)
	$ 75,721	$ (165)	$ 28,435	$ (82)	$ 104,156	$ (247)
As of December 31, 2021:						
U.S. Treasury securities (due in less than one year)	$ 15,567	$ (18)	$ —	$ —	$ 15,567	$ (18)
U.S. Treasury securities (due in one to two years)	1,521	(3)	—	—	1,521	(3)
Municipal securities (due in one to two years)	2,985	(15)	—	—	2,985	(15)
Government-sponsored enterprise securities (due in less than one year)	1,500	—	4,993	(7)	6,493	(7)
Commercial paper (due in less than one year)	66,872	(38)	—	—	66,872	(38)
Corporate notes (due in less than one year)	16,001	(17)	—	—	16,001	(17)
Corporate notes (due in one to two years)	24,145	(79)	—	—	24,145	(79)
	$ 128,591	$ (170)	$ 4,993	$ (7)	$ 133,584	$ (177)

The gross unrealized losses related to U.S. Treasury securities, municipal securities, government-sponsored enterprise securities, commercial paper and corporate notes as of December 31, 2022 and 2021 were due to changes in interest rates and not credit risk. We determined that the gross unrealized losses on our cash equivalents and marketable securities as of December 31, 2022 and 2021 were temporary in nature. Our exposure to unrealized losses may increase in the future due to the economic pressures or uncertainties associated with local or global economic recessions as a result of the ongoing COVID-19 pandemic and ongoing geopolitical events, such as the current military conflict between Ukraine and Russia, as well as recent and potential future disruptions in access to bank deposits or lending commitments due to bank failure. We review our investments quarterly to identify and evaluate whether any investments have indications of possible other-than-temporary impairment. Factors considered in determining whether a loss is temporary include the length of time and extent to which the fair value has been less than the amortized cost basis and whether we intend to sell the security or whether it is more likely than not that we would be required to sell the security before recovery of the amortized cost basis. We currently do not intend to sell these securities before recovery of their amortized cost bases.

Fair Value on a Recurring Basis

We categorize financial instruments recorded at fair value on our consolidated balance sheets based upon the level of judgment associated with inputs used to measure their fair value. The categories are as follows:

Level 1—Inputs are unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date. An active market for the asset or liability is a market in which transactions for the asset or liability occur with sufficient frequency and volume to provide pricing information on an ongoing basis.

Level 2—Inputs (other than quoted market prices included in Level 1) are either directly or indirectly observable for the asset or liability through correlation with market data at the measurement date and for the duration of the instrument's anticipated life.

Level 3—Inputs reflect management's best estimate of what market participants would use in pricing the asset or liability at the measurement date. Consideration is given to the risk inherent in the valuation technique and the risk inherent in the inputs to the model.

A financial instrument's categorization within the valuation hierarchy is based upon the lowest level of input that is significant to the fair value measurement. Below is a description of the valuation methodologies used for financial instruments measured at fair value on our consolidated balance sheets, including the category for such financial instruments.

Money market funds and certificates of deposit are categorized as Level 1 within the fair value hierarchy as their fair values are based on quoted prices available in active markets. Commercial paper, U.S. Treasury securities, municipal securities, government-sponsored enterprise securities and corporate notes are categorized as Level 2 within the fair value hierarchy as their fair values are estimated by using pricing models, quoted prices of securities with similar characteristics or discounted cash flows.

The following table presents information about our financial instruments that are measured at fair value on a recurring basis as of December 31, 2022 and 2021 and indicates the fair value category assigned.

	Fair Value Measurements at Reporting Date Using			
(In thousands)	Quoted Prices in Active Markets for Identical Assets Level 1	Significant Other Observable Inputs Level 2	Significant Unobservable Inputs Level 3	Total
As of December 31, 2022:				
Money market funds[1][2]	$ 39,864	$ —	$ —	$ 39,864
Certificate of deposit[2]	271	—	—	271
U.S. Treasury securities[3]	—	12,921	—	12,921
Municipal securities[3]	—	2,976	—	2,976
Government-sponsored enterprise securities[3]	—	9,846	—	9,846
Commercial paper[3]	—	64,199	—	64,199
Corporate notes[3]	—	25,959	—	25,959
Total	$ 40,135	$ 115,901	$ —	$ 156,036
As of December 31, 2021:				
Money market funds[1]	$ 24,207	$ —	$ —	$ 24,207
U.S. Treasury securities[3][4]	—	17,088	—	17,088
Municipal securities[4]	—	2,985	—	2,985
Government-sponsored enterprise securities[3]	—	12,493	—	12,493
Commercial paper[1][3]	—	91,861	—	91,861
Corporate notes[3][4]	—	60,574	—	60,574
Total	$ 24,207	$ 185,001	$ —	$ 209,208

(1) Included in cash and cash equivalents on our consolidated balance sheets.

(2) Included in restricted cash on our consolidated balance sheets.

(3) Included in current portion of marketable securities on our consolidated balance sheets.

(4) Included in noncurrent portion of marketable securities on our consolidated balance sheets.

Equity Investment

In December 2007, we received 13,842,625 ordinary shares in Sienna Cancer Diagnostics Limited, or Sienna, in connection with a license we granted to them for our hTERT technology for use in human diagnostics. The shares, which represented less than 20% ownership, were recorded at a zero cost basis under the cost method of accounting, upon receipt. Since the adoption of ASU 2016-01 on January 1, 2018, we reassessed the fair value of our equity investment in Sienna at each reporting date and any resulting change in fair value was recognized on our consolidated statements of operations. In April 2020, Sienna announced its merger with BARD1 Life Sciences Limited, or BARD1, subject to approval by Sienna's shareholders. Effective August 3, 2020, the merger was complete, and we received 13 BARD1 shares for every five shares of Sienna ordinary shares, resulting in our ownership of 35,990,825 shares of BARD1.

During the first quarter of 2021, we sold all of our holdings in BARD1 and recognized a net gain of approximately $1,233,000 from the sales, including gains from foreign currency translation adjustments, which has been included in other income and expense on our consolidated statements of operations. As of March 31, 2021, no value remained for our equity investment in BARD1.

Credit Risk

We currently place our cash, restricted cash, cash equivalents and marketable securities with five financial institutions in the United States. Generally, these deposits may be redeemed upon demand and therefore, bear minimal risk. Deposits with banks may exceed the amount of insurance provided on such deposits. Financial instruments that potentially subject us to concentrations of credit risk consist primarily of cash equivalents and marketable securities. Cash equivalents and marketable securities currently consist of money market funds, government-sponsored enterprise securities, U.S. Treasury securities, municipal securities, commercial paper and corporate notes. Our investment policy, approved by the audit committee of our board of directors, limits the amount

we may invest in any one type of investment issuer, thereby reducing credit risk concentrations. However, we are exposed to credit risk in the event of default by the financial institutions holding our cash and cash equivalents to the extent recorded in our consolidated balance sheets. We have not experienced any losses in such accounts and we believe that we are not exposed to significant credit risk of our financial position at the depository institutions in which those deposits are held.

3. PROPERTY AND EQUIPMENT

Property and equipment, stated at cost, is comprised of the following:

	December 31,	
(In thousands)	2022	2021
Furniture and computer equipment	$ 1,554	$ 1,171
Leasehold improvements	135	129
	1,689	1,300
Less accumulated depreciation and amortization	(896)	(650)
	$ 793	$ 650

4. LICENSE AGREEMENT

Janssen Pharmaceuticals, Inc. License Agreement

On September 15, 2016, we entered into the License Agreement with Janssen Pharmaceuticals whereby we granted to Janssen Pharmaceuticals an exclusive worldwide license, or the Exclusive License, under our proprietary patents for the research, development and commercialization of products based on specialized oligonucleotide backbone chemistry and novel amidates for ribonucleic acid interference. In addition to the Exclusive License, we granted to Janssen Pharmaceuticals a non-exclusive worldwide license, or the Non-Exclusive License, under our patents covering the synthesis of monomers. This agreement was terminated effective April 2021.

5. ACCRUED LIABILITIES

Accrued liabilities consisted of the following:

	December 31,	
(In thousands)	2022	2021
CRO and clinical trial costs	$ 17,040	$ 22,804
Manufacturing activities	5,321	4,123
Professional legal and accounting fees	9,668	2,030
Interest payable	561	336
Other	510	541
	$ 33,100	$ 29,834

6. COMMITMENTS AND CONTINGENCIES

Purported Securities Lawsuits

Between January 23, 2020 and March 5, 2020, three securities class action lawsuits were filed against us and certain of our officers. One of the lawsuits was voluntarily dismissed on March 19, 2020. The other two lawsuits, filed in the U.S. District Court, or the Court, for the Northern District of California, or the Northern District, were consolidated by the Court on May 14, 2020, and on August 20, 2020, the lead plaintiffs filed a consolidated class action complaint. The consolidated class action complaint alleges violations of the Securities Exchange Act of 1934, as amended, or the Exchange Act, in connection with allegedly false and misleading statements made by us related to IMbark during the period from March 19, 2018, to September 26, 2018. The consolidated class action complaint alleges, among other things, that we violated Sections 10(b) and 20(a) of the Exchange Act and SEC Rule 10b-5 by failing to disclose facts related to the alleged failure of IMbark to meet the two primary endpoints of the trial, spleen response rate and Total Symptom Score, and that our stock price dropped when such information was disclosed. The plaintiffs in the consolidated class action complaint seek damages and interest, and an award of reasonable costs, including attorneys' fees. On October 22, 2020, lead plaintiffs filed an amended consolidated class action complaint. We filed a motion to dismiss the amended consolidated class action complaint on November 23, 2020. On April 12, 2021, the Court granted in part and denied in part our motion to dismiss. Our answer to the amended consolidated

class action complaint was filed on May 13, 2021. On September 30, 2021, lead plaintiffs filed their motion for class certification, and on April 2, 2022, the Court granted the lead plaintiffs' motion for class certification. On September 2, 2022, the parties agreed to a settlement and entered into a Stipulation and Agreement of Settlement, or the Stipulation, which is subject to court approval. On October 13, 2022, the Court preliminarily approved the parties' settlement, permitted notice to be distributed to the class members, and scheduled a final approval hearing for March 30, 2023. Final approval of the settlement is subject to a number of conditions and contingencies out of our control. There can be no guarantee that all of these conditions and contingencies will occur. Should a material condition or contingency to the settlement fail to occur, one or both of the parties to the settlement may exercise their right to terminate the settlement agreement.

Under the terms of the Stipulation, in exchange for the release and dismissal with prejudice of all claims against the defendants in the consolidated class action complaint, we agreed to pay and/or to cause our insurance carriers to pay a total of $24,000,000, comprised of $17,000,000 in cash, which was paid into an escrow account under our available D&O insurance coverage and, at our election, $7,000,000 in either shares of our common stock and/or cash which is payable after final approval of the settlement by the Court. The proposed settlement does not constitute an admission of fault or wrongdoing by Geron or our Chief Executive Officer. The proposed settlement remains subject to final approval by the Court and certain other conditions. As of December 31, 2022, our portion of the settlement amount of $7,000,000 has been included in accrued liabilities on our consolidated balance sheets and recognized as general and administrative expense on our consolidated statements of operations for the year ended December 31, 2022.

Between April 23, 2020 and June 8, 2021, seven shareholder derivative actions were filed, naming as defendants certain of our current officers and certain current and former members of our board. Of these actions, or the Derivative Lawsuits, two were filed in the Northern District, two were filed in the Court of Chancery of the State of Delaware, two were filed in the U.S. District Court for the District of Delaware, and one was filed in the Superior Court of California for the County of San Mateo, respectively. The plaintiffs in the Derivative Lawsuits allege breach of fiduciary duty and/or violations of Section 14 of the Exchange Act, based on the same underlying facts as the consolidated class action lawsuit described above. The plaintiffs seek damages, corporate governance reforms, equitable relief, restitution, and an award of reasonable costs, including attorneys' fees. The status of the seven Derivative Lawsuits is currently as follows:

- On July 2, 2021, we filed a motion to dismiss the consolidated shareholder derivative actions filed in the Court of Chancery of the State of Delaware, or the Chancery Court Derivative Lawsuits. On September 1, 2021, the plaintiffs filed a consolidated amended complaint in the Chancery Court Derivative Lawsuits. On October 12, 2021, we filed our motion to dismiss the consolidated amended complaint. The Court of Chancery of the State of Delaware heard oral argument on the motion on February 15, 2022, and, on June 22, 2022, issued an order staying its decision on our motion to dismiss until after final resolution of the consolidated class action lawsuit described above. On December 21, 2022, the parties in the Chancery Court Derivative Lawsuits entered into a Stipulation of Settlement, or the Derivative Stipulation, that, subject to final approval by the Court of Chancery of the State of Delaware, will resolve the Chancery Court Derivative Lawsuits. A final approval hearing regarding the Derivative Stipulation has been scheduled for May 17, 2023. Final approval of the settlement is subject to a number of conditions and contingencies out of our control. There can be no guarantee that all of these conditions and contingencies will occur. Should a material condition or contingency to the settlement fail to occur, one or more of the parties to the settlement may exercise their right to terminate the settlement agreement;
- The consolidated shareholder derivative actions filed in the U.S. District Court for the District of Delaware have been stayed pending the ruling on our motion to dismiss the Chancery Court Derivative Lawsuits. On December 21, 2022, the parties in the consolidated District of Delaware derivative actions entered into the Derivative Stipulation, that, subject to final approval by the Court of Chancery of the State of Delaware, will resolve the consolidated District of Delaware derivative actions;
- The consolidated shareholder derivative actions filed in the Northern District were initially stayed through the ruling on our motion to dismiss in the consolidated class action lawsuit described above and then subsequently were stayed through the ruling on the lead plaintiffs' motion for class certification in the consolidated class action lawsuit. Subsequent to the grant of class certification in the consolidated class action lawsuit, on May 3, 2022, the Northern District entered an order providing plaintiffs until June 7, 2022, to file an amended complaint. On June 7, 2022, plaintiffs filed an amended shareholder derivative complaint. On July 6, 2022, the Northern District entered an order staying the consolidated shareholder derivative actions filed in the Northern District until the earlier of either a public announcement of a settlement in the consolidated class action lawsuit or a final, non-appealable judgment in the consolidated class action lawsuit. The stay has subsequently been extended on a number

of occasions and the case is currently stayed through March 31, 2023. On December 21, 2022, the parties in the consolidated derivative actions in the Northern District entered into the Derivative Stipulation, that, subject to final approval by the Court of Chancery of the State of Delaware, will resolve the consolidated derivative actions in the Northern District; and

- Our motion to dismiss the shareholder derivative action pursuant to the forum selection clause in our amended and restated bylaws was filed in the Superior Court of California for the County of San Mateo on August 5, 2021. At the hearing on the motion to dismiss on November 2, 2021, the court granted our motion to dismiss and stayed the case until April 19, 2022. At the case management conference on April 19, 2022, the court continued the stay until June 14, 2022. At the case management conference on June 14, 2022, the court continued the stay until December 13, 2022. On December 13, 2022, the court dismissed the action without prejudice.

Under the terms of the Derivative Stipulation, in exchange for the release and dismissal with prejudice of all claims against the defendants in the consolidated shareholder derivative actions filed in the Northern District, we agreed to pay and/or to cause our insurance carriers to pay a total of $1,350,000, comprised of $525,000 in cash, which is payable under our available D&O insurance coverage and $825,000 in cash payable by us. The proposed settlement remains subject to final approval by the Court and certain other conditions, upon which the settlement amounts are payable. The proposed settlement does not constitute an admission of fault or wrongdoing by our current officers or current and former members of our board. As of December 31, 2022, we have recorded the total settlement amount of $1,350,000 as accrued liabilities and $525,000 as interest and other receivables on our consolidated balance sheets. For the year ended December 31, 2022, we have recognized our portion of the settlement of $825,000 as general and administrative expense on our consolidated statements of operations.

The pending lawsuits and any other related lawsuits are subject to inherent uncertainties, and the actual defense and disposition costs will depend upon many unknown factors. The outcome of the pending lawsuits and any other related lawsuits is necessarily uncertain. We could be forced to expend significant resources in the defense against the pending lawsuits and any other related lawsuits, and we may not prevail. In addition, we have and may continue to incur substantial legal fees and costs in connection with such lawsuits. As discussed above, we have recorded the total settlement amount for the Derivative Stipulation on our consolidated balance sheets as of December 31, 2022 and our portion of the settlement amount under the Stipulation remains accrued on our consolidated balance sheets as of December 31, 2022. We currently are not able to estimate the possible additional costs to us, if any, from these matters, and we cannot be certain how long it may take to resolve the pending lawsuits or the possible amount of any damages or legal costs that we may be required to pay. Such amounts could be material to our consolidated financial statements if we do not prevail in the defense against the pending lawsuits and any other related lawsuits, or even if we do prevail. We have not established any reserve for any potential liability relating to the pending lawsuits and any other related lawsuits, other than settlement amounts under the Stipulation and the Derivative Stipulation. It is possible that we could, in the future, incur judgments or enter into settlements of claims for monetary damages.

Indemnifications to Officers and Directors

Our corporate bylaws require that we indemnify our directors, as well as those who act as directors and officers of other entities at our request, against expenses, judgments, fines, settlements and other amounts actually and reasonably incurred in connection with any proceedings arising out of their services to Geron. In addition, we have entered into separate indemnification agreements with each of our directors and officers which provide for indemnification of these directors and officers under similar circumstances and under additional circumstances. The indemnification obligations are more fully described in our bylaws and the indemnification agreements. We purchase standard insurance to cover claims or a portion of the claims made against our directors and officers. Since a maximum obligation is not explicitly stated in our bylaws or in our indemnification agreements and will depend on the facts and circumstances that arise out of any future claims, the overall maximum amount of the obligations cannot be reasonably estimated.

Severance Plan

We have an Amended and Restated Severance Plan, or Severance Plan, that applies to all employees that are (i) above the Vice President level, (ii) hired by the Company before January 1, 2022, or (iii) not subject to performance improvement plans, and provides for, among other benefits: (i) a severance payment upon a Change of Control Triggering Event and Separation from Service and (ii) a severance payment for each non-executive employee upon a Non-Change of Control Triggering Event and Separation from Service. As defined in the Severance Plan, a Change of Control Triggering Event and Separation from Service requires a “double trigger” where: (i) an employee is terminated by us without cause in connection with a change of control or within 12

months following a change of control provided, however, that if an employee is terminated by us in connection with a change of control but immediately accepts employment with our successor or acquirer, the employee will not be eligible for the benefits outlined in the Severance Plan, (ii) an employee resigns because in connection with a change of control, the offered terms of employment (new or continuing) by us or our successor or acquirer within 30 days after the change of control results in a material change in the terms of employment, or (iii) after accepting (or continuing) employment with us after a change of control, an employee resigns within 12 months following a change of control due to a material change in the terms of employment. Under the Severance Plan, a Non-Change of Control Triggering Event and Separation from Service is defined as an event where a non-executive employee is terminated by us without cause. Severance payments range from three to 18 months of base salary, depending on the employee's position with us, payable in a lump sum payment. The Severance Plan also provides that the provisions of employment agreements entered into between us and executive or non-executive employees supersede the provisions of the Severance Plan. As of December 31, 2022, all our executive officers have employment agreements with provisions that may provide greater severance benefits than those in the Severance Plan.

Risks Related to Global Economic Conditions, COVID-19 and the Military Conflict Between Ukraine and Russia

As of the date of this filing, significant uncertainty exists concerning the ultimate duration and severity of the COVID-19 pandemic and the military conflict between Ukraine and Russia. Both of these events have caused widespread, continually evolving and unpredictable impacts on global societies, economies, financial markets and business practices. With respect to the COVID-19 pandemic, we are closely monitoring the impact of the pandemic, the identification of new variants of the COVID-19 virus and related developments, and our focus remains on promoting employee health and safety while continuing to advance the development of imetelstat. For both our Phase 3 clinical trials, IMerge and IMpactMF, we have limited ongoing clinical trial activity in Ukraine and Russia, but we have experienced, and may continue to experience, delays and suspensions in clinical trial activities at clinical sites in Ukraine and Russia due to the current political and civil unrest conditions. With support from our CRO, we are monitoring the impact of the conflict on our clinical trial activities.

Due to the dynamic and unpredictable effects of the COVID-19 pandemic, we have had and expect to continue to have disruptions and/or delays in our imetelstat development program, including with respect to our ability to initiate trial sites, enroll and assess patients, maintain patient enrollment, ensure patient clinical and lab collection visits, conduct monitoring visits, supply study drug, report trial results, and interact with regulators or other important agencies due to limitations in employee resources or otherwise. Restrictions on travel, availability of site personnel, and diversion of hospital staff and resources to COVID-19 patients, have disrupted our trial operations, as well as patient recruitment in many areas, resulting in a slowdown in patient enrollment and/or deviations from or disruptions in key clinical trial activities, such as clinical trial site initiation and monitoring. If the effects of the COVID-19 pandemic continue and/or become more severe, we could experience significant disruptions to our clinical development timelines, delays in clinical site initiation and patient enrollment in IMpactMF, IMproveMF and the investigator-led trial IMpress, and other disruptions that could severely impact our business and the imetelstat development program.

We have taken and intend to take those actions with regard to COVID-19 that may be required by federal, state or local authorities or that we determine are in the best interests of our patients, investigators, employees and stockholders. In response to the COVID-19 pandemic and previous "shelter in place" and similar orders issued by state and local governments, we have allowed voluntary access to our offices in California and New Jersey to employees who have been vaccinated, and almost all of our employees continue to work remotely without any significant disruption to our business. Our increased reliance on personnel working remotely could increase our cybersecurity risk, create data accessibility concerns and make us more susceptible to communication disruptions, any of which could adversely impact our business operations. These and similar, and perhaps more severe, disruptions in our operations could occur which would negatively impact our business and business prospects, our financial condition and the future of imetelstat.

The effects of the COVID-19 pandemic and the military conflict between Ukraine and Russia, including the significant sanctions imposed against Russia, as well as broader economic conditions, including inflation, rising interest rates, the prospects for recession, and recent and potential future disruptions in access to bank deposits or lending commitments due to bank failure have increased market volatility and could result in a significant long-term disruption of global financial markets, reducing or eliminating our ability to raise additional capital, which could negatively affect our liquidity, our ability to complete IMpactMF, IMproveMF and the investigator-led trial IMpress and to commence, conduct and complete any other potential future clinical trials of imetelstat. In addition, the global economic slowdown caused by, among other things, the COVID-19 pandemic and the military conflict between Ukraine and Russia, as well as inflation, rising interest rates, the prospects for recession, and recent and potential

future disruptions in access to bank deposits or lending commitments due to bank failures could materially and adversely affect our business and the value of our common stock.

The extent to which global economic conditions, including those resulting from the COVID-19 pandemic, the military conflict between Ukraine and Russia and recent and potential future bank failures, ultimately impact our business, our regulatory and clinical development activities, clinical supply chain and other business operations, as well as the value of and market for our common stock, will depend on future developments that are highly uncertain and cannot be predicted with confidence at this time, such as the ultimate duration and severity of the pandemic, travel restrictions, quarantines, social distancing and business closure requirements in the United States, or U.S., and in other countries, the effectiveness of actions taken globally to contain and treat COVID-19, whether the military conflict between Ukraine and Russia resolves in a timely manner, or at all, and whether the U.S. and/or international banking system stabilizes in light of recent and potential future bank failures. Accordingly, we do not yet know the full extent of potential delays or impacts on our business, our regulatory and clinical development activities, clinical supply chain and other business operations or the global economy as a whole. However, these effects could materially and adversely affect our business and business prospects, our financial condition and the future of imetelstat.

7. OPERATING LEASES

New Jersey Office Space Lease

In April 2019, we entered into an operating lease agreement for office space located at 3 Sylvan Way, Parsippany, New Jersey, or the New Jersey Lease. The initial term of the New Jersey Lease is 11 years with an option to extend for an additional five years and a one-time option to terminate the New Jersey Lease without cause as of the 103rd month anniversary of the commencement date of the lease. The New Jersey Lease commenced on October 1, 2019, upon our control of the office space on that date. Based on the initial term of the New Jersey Lease of 11 years, the right-of-use asset and corresponding operating lease liability was approximately $2,356,000, which represented the present value of lease payments over the initial lease term, net of a seven-month rent abatement period, using an incremental borrowing rate of 8% based on information available as of October 1, 2019. Under the New Jersey Lease, we are also obligated to pay certain variable expenses separately from the base rent, including electricity and common area maintenance. Such costs are being expensed in the period they are incurred. As of December 31, 2022, the remaining lease term for the New Jersey Lease is 7.8 years.

Foster City Office Space Lease

In October 2019, we entered into an operating lease agreement for office space located at 919 East Hillsdale Boulevard, Foster City, California, or the Foster City Lease. The initial term of the Foster City Lease is 87 months with an option to extend for an additional five years.

The Foster City Lease commenced on March 10, 2020, upon the substantial completion of all tenant improvements. As of the lease commencement date, the right-of-use asset and corresponding operating lease liability was approximately $3,426,000, which represented the present value of remaining lease payments using an incremental borrowing rate of 7% over the initial lease term of 87 months, net of a three-month rent abatement period. Under the Foster City Lease, we are also obligated to pay certain variable expenses separately from the base rent, including taxes and common area maintenance. Such costs are considered non-lease components and have been excluded from the calculation of the right-of-use asset and corresponding operating lease liability and are being expensed in the period they are incurred. As of December 31, 2022, the remaining lease term for the Foster City Lease is 4.5 years.

The components of lease costs included in operating expenses on our consolidated statements of operations for the New Jersey Lease, the Foster City Lease and a lease from a former location in Menlo Park, California, were as follows:

	Year Ended December 31,		
(In thousands)	2022	2021	2020
Operating lease costs	$ 944	$ 946	$ 1,143
Variable lease costs (1)	310	252	293
Total lease costs	$ 1,254	$ 1,198	$ 1,436

(1) Variable lease costs represent non-lease components, such as common area maintenance charges.

The undiscounted future non-cancellable lease payments under the New Jersey Lease and the Foster City Lease as of December 31, 2022 were as follows (in thousands):

2023	$ 962
2024	987
2025	1,014
2026	1,040
2027	717
Thereafter	1,050
Total lease payments	5,770
Less: imputed interest	(1,174)
Total	$ 4,596

8. DEBT

On September 30, 2020, or the Closing Date, we, Hercules Capital, Inc., or Hercules, and Silicon Valley Bank, or SVB, entered into a term loan facility, or the Term Loan, up to $75,000,000, which was amended in August 2021, or the Original Loan Agreement. On June 30, 2022, or the Effective Date, we entered into a second amendment to the Original Loan Agreement, or as amended, the Loan Agreement. Under the second amendment, the aggregate principal amount available to us increased from $75,000,000 to $125,000,000, with such principal being available in a series of tranches, subject to certain terms and conditions. As of December 31, 2022, a total of $50,000,000 has been drawn under the Loan Agreement.

Under the second amendment, the $75,000,000 in remaining loan principal as of December 31, 2022 can be drawn as follows: (a) the first tranche of $20,000,000 is available within the earlier of 30 days of the achievement of certain clinical and financial milestones or September 15, 2023, subject to the achievement of such milestones; (b) the second tranche of $10,000,000 is available from January 1, 2023 until December 15, 2023, subject to the achievement of certain clinical and regulatory milestones, and satisfaction of certain other requirements; (c) the third tranche of $20,000,000 is available from September 15, 2023 until September 15, 2024, subject to the achievement of certain clinical and regulatory milestones, and satisfaction of certain capitalization requirements; and (d) the final tranche of $25,000,000 is available through December 31, 2024, subject to approval by an investment committee comprised of Hercules and SVB (or its successor, if any). However, on March 10, 2023, the Federal Deposit Insurance Corporation, or FDIC, issued a press release stating that SVB was closed by the California Department of Financial Protection and Innovation, which appointed the FDIC as receiver. Of the remaining term commitments under the Loan Agreement, Hercules and its affiliates hold 65% and 35% were held by SVB. As a result of the closure of SVB, we do not know whether and to what extent we would be able to draw down the remaining $55.0 million under the Loan Agreement, even if we meet the conditions set forth in the Loan Agreement necessary for additional draw downs, and it is possible that we will not be able to access any additional funding under the Loan Agreement. With the exception of the final tranche, and subject to achievement of the applicable milestones and other requirements with respect to each tranche, draw downs are at our election.

Under the second amendment, the maturity date, interest only payment dates, end of term charges, collateral, events of default, representations, warranties and covenants remain consistent with the terms of the Original Loan Agreement, except as follows:

- Beginning June 1, 2022 and prior to the regulatory approval for imetelstat, or the potential Regulatory Approval, if any, we are required to maintain a minimum cash balance in an amount equal to the greater of: 50% of the outstanding principal amount under the Loan Agreement or $30,000,000.
- After the potential Regulatory Approval, if any, the minimum cash requirement may be satisfied through one of the following three options, as elected by us: (a) maintaining a cash balance in an amount not less than 40% of the outstanding principal amount under the Loan Agreement; (b) maintaining a cash balance in an amount not less than 25% of the outstanding principal amount under the Loan Agreement, if our market cap is or exceeds $750,000,000; or (c) maintaining six month net product revenues of at least 70% of net product revenues forecasted by us, should any potential Regulatory Approval for imetelstat be obtained.

On the Effective Date of the second amendment, we paid $100,000 as a facility charge that we recognized as a debt discount and are amortizing such cost to interest expense over the life of the loan using the effective interest rate method. Additional facility charges applied to future draw downs will be treated similarly. We incurred approximately $75,000 in legal fees in connection with the second amendment, which we recognized as debt

issuance costs and are amortizing such cost to interest expense over the life of the loan using the effective interest rate method. Future debt issuance costs will be treated similarly. Under the second amendment, if we choose to prepay the principal with respect to any future draw down after the Effective Date, any such prepayment within the first 36 months after the Effective Date will be subject to a prepayment charge equal to 1.5% of the principal amount prepaid. No prepayment charge will be assessed for any prepayment occurring more than 36 months after the Effective Date.

Unchanged from the Original Loan Agreement, the Term Loan matures on October 1, 2024, or the Loan Maturity Date, and may be extended up to an additional 12 months upon the achievement of certain clinical, regulatory and financial milestones. The Term Loan bears interest at a floating rate per annum equal to the greater of either (i) 9.0% or (ii) 9.0% plus the prime rate as reported in The Wall Street Journal (7.5% as of December 31, 2022) less 3.25%. The Term Loan provided for an initial interest-only payment period from the Closing Date until November 1, 2022. As of December 31, 2022, the interest-only period expires May 1, 2023. Upon the achievement of certain regulatory and financial milestones, the interest-only period may be extended for another six months until November 1, 2023. Following the expiration of the interest-only period, we will repay the Term Loan in equal monthly amortization payments of principal and interest until the Loan Maturity Date. Upon full repayment of the Term Loan, we are also obligated to pay an end of term charge in an amount equal to 6.55% of the amount of the Term Loan actually borrowed. Such end of term charge is being accrued to interest expense over the term of the Term Loan using the effective interest rate method. At our option, upon at least five business days' prior written notice to Hercules, we may prepay all or any portion greater than or equal to $5,000,000 of the outstanding loan by paying the entire principal balance (or portion thereof) and all accrued and unpaid interest. Such prepayment is subject to a prepayment charge of 1.5% of the prepayment amount, if the prepayment is made in any of the first 36 months following the Closing Date for any draw downs prior to the second amendment. Thereafter, any prepayment is not subject to a prepayment charge.

The Term Loan is secured by substantially all of Geron's assets, except our intellectual property, which is the subject of a negative pledge. The Term Loan contains certain representations and warranties, affirmative covenants, negative covenants and conditions that are customarily required for similar financings. We are in compliance with the covenants under the Term Loan as of December 31, 2022.

In the event of default (subject, in certain instances, to specified grace periods), the principal, interest and any other monetary obligations on all the then outstanding amounts under the Term Loan may become due and payable immediately. Upon the occurrence of an event of default, a default interest rate of an additional 5% may be applied to the outstanding principal balance, and Hercules, as the administrative agent, may declare all outstanding obligations immediately due and payable (subject, in certain instances, to specified grace periods) and take such other actions as set forth in the Term Loan. Upon the occurrence of certain bankruptcy and insolvency events, the obligations under the Term Loan would automatically become due and payable.

Embedded Derivatives and Debt Discounts

The conditional exercisable call option related to the event of default is considered to be an embedded derivative which is required to be bifurcated and accounted for as a separate financial instrument. In the periods presented, the value of the embedded derivative is not material and therefore, no amount has been recognized. If an event of default becomes more probable than is currently estimated, then the embedded derivative could become material in future periods and would be recognized as a separate financial instrument at that time.

As of December 31, 2022, the net carrying value of the Term Loan was $51,157,000, which includes the principal amount of $50,000,000 less the net unamortized discounts and debt issuance costs of $628,000 plus accrued end of term charge of $1,785,000. The carrying value of the debt approximates the fair value as of December 31, 2022. The debt discounts and debt issuance costs are being amortized to interest expense over the life of loan amounts under Term Loan using the effective interest rate method.

Future Minimum Payments

The following table presents future minimum payments, including interest and the end of term charge, under the Term Loan as of December 31, 2022 (in thousands):

2023	$ 26,843
2024	34,160
Total	61,003
Less: amount representing interest	(7,728)
Less: unamortized debt discount and issuance costs	(628)
Less: unamortized end of term charge	(1,490)
Less: current portion of debt	(20,945)
Noncurrent portion of debt	$ 30,212

9. STOCKHOLDERS' EQUITY

Authorized Common Stock

In May 2021, our stockholders approved an amendment to our Restated Certificate of Incorporation to increase the total number of authorized shares of common stock from 450,000,000 to 675,000,000 shares.

Public Offering

On April 1, 2022, we completed an underwritten public offering of 53,333,334 shares of our common stock and a pre-funded warrant to purchase 18,095,238 shares of our common stock, or the 2022 pre-funded warrant, together with accompanying warrants to purchase 35,714,286 shares of our common stock, also known as the 2022 stock purchase warrants. The shares of common stock and the 2022 pre-funded warrant were immediately separable from the 2022 stock purchase warrants. All of the securities were issued separately. The combined public offering price of the common stock and accompanying 2022 stock purchase warrants was $1.05 per share. The 2022 stock purchase warrants have an exercise price of $1.45 per share and are exercisable immediately. The term of the 2022 stock purchase warrants expires on the earlier to occur of (a) the date that is 30 business days following the date on which we first issue a press release disclosing, if applicable, that the United States Food and Drug Administration, or FDA, has accepted for filing a New Drug Application submitted to the FDA for imetelstat in Low or Intermediate-1 risk myelodysplastic syndromes and (b) April 1, 2027. The combined public offering price of the 2022 pre-funded warrant and accompanying 2022 stock purchase warrant was $1.049 per share. The 2022 pre-funded warrant has an exercise price of $0.001 per share and may be exercised at any time until the 2022 pre-funded warrant is exercised in full. As of December 31, 2022, none of the 2022 pre-funded warrant and 2022 stock purchase warrants have been exercised. The net cash proceeds from this offering were $69,916,000, after deducting the underwriting discount and other offering expenses paid by us, and exclude any future proceeds from the exercise of the 2022 pre-funded warrant and 2022 stock purchase warrants.

Upon the issuance of the 2022 pre-funded warrant and 2022 stock purchase warrants, we evaluated the terms of each warrant to determine the appropriate accounting and classification pursuant to FASB Accounting Standards Codification Topic 480, *Distinguishing Liabilities from Equity*, and FASB Accounting Standards Codification Topic 815, *Derivatives and Hedging*. Warrants are classified as liabilities when the warrant terms allow settlement of the warrant exercise in cash and classified as equity when the warrant terms only allow settlement in shares of common stock. The terms of the 2022 pre-funded warrant and the 2022 stock purchase warrants include certain provisions related to fundamental transactions and a cashless exercise provision in the event registered shares are not available, and do not include any mandatory redemption provisions. Based on our evaluation, we concluded the 2022 pre-funded warrant and the 2022 stock purchase warrants should be classified as equity with no subsequent remeasurement as long as such warrants continue to be classified as equity.

Warrant Exercises

For the year ended December 31, 2022, warrants to purchase 11,663,387 shares of our common stock were exercised for net cash proceeds of approximately $15,163,000. The warrants were issued in connection with an underwritten public offering of common stock and a pre-funded warrant, together with accompanying stock purchase warrants in May 2020. As of December 31, 2022, the pre-funded warrant to purchase 8,335,239 shares of

our common stock was outstanding and stock purchase warrants to purchase 44,110,079 shares of our common stock associated with the May 2020 public offering remained outstanding.

Sales Agreement

On September 4, 2020, we entered into an At Market Issuance Sales Agreement, or the 2020 Sales Agreement, with B. Riley Securities, Inc., or B. Riley, pursuant to which we may elect to issue and sell shares of our common stock having an aggregate offering price of up to $100,000,000 in such quantities and on such minimum price terms as we set from time to time through B. Riley as our sales agent. We agreed to pay B. Riley an aggregate commission rate equal to up to 3.0% of the gross proceeds of the sales price per share for common stock sold through B. Riley under the 2020 Sales Agreement. In connection with the 2020 Sales Agreement, we terminated the 2018 Sales Agreement. For the year ended December 31, 2021, we sold an aggregate of 10,571,556 shares of our common stock pursuant to the 2020 Sales Agreement, resulting in net cash proceeds to us of approximately $20,385,000, after deducting sales commissions and other offering expenses paid by us. No shares of our common stock were sold pursuant to the 2020 Sales Agreement for the year ended December 31, 2022. The 2020 Sales Agreement will expire upon the earlier of: (a) the sale of all common stock subject to the 2020 Sales Agreement, or (b) September 4, 2023.

Equity Plans

2011 Incentive Award Plan

In May 2011, our stockholders approved the adoption of the 2011 Incentive Award Plan, or 2011 Plan. The 2011 Plan provided for grants of either incentive stock options or nonstatutory stock options and stock purchase rights to employees (including officers and employee directors) and consultants (including non-employee directors). Upon the adoption of the 2018 Equity Incentive Plan in May 2018 (see below), no further grants of stock options or stock purchase rights were made from the 2011 Plan. Stock options granted under the 2011 Plan expire no later than ten years from the date of grant. Stock option exercise prices were equal to the fair market value of the underlying common stock on the date of grant.

Service-based stock options under the 2011 Plan generally vested over a period of four years from the date of the stock option grant. Other stock awards (restricted stock awards and restricted stock units) had variable vesting schedules which were determined by our board of directors on the date of grant. All outstanding awards granted under the 2011 Plan remain subject to the terms of the 2011 Plan and the individual award agreements thereunder.

2018 Equity Incentive Plan

On May 15, 2018, our stockholders approved the adoption of the 2018 Equity Incentive Plan, or 2018 Plan, as the successor to the 2011 Plan. The 2018 Plan provides for the grant of incentive stock options, nonstatutory stock options, stock appreciation rights, restricted stock awards, restricted stock unit awards, other stock awards, and performance awards that may be settled in cash, stock, or other property. Eligible participants under the 2018 Plan include our employees, consultants and non-employee directors. The number of shares reserved for issuance under the 2018 Plan (subject to adjustment for certain changes in capitalization) is equal to the sum of (i) the unallocated shares of common stock remaining available for grant under the 2011 Plan as of May 15, 2018, (ii) 10,000,000 newly reserved shares of common stock and (iii) the number of shares subject to awards granted under the 2002 Equity Incentive Plan, and the 2011 Plan as such shares become available from time to time, referred to as the Prior Plans' Returning Shares. Such Prior Plans' Returning Shares become available for issuance under the 2018 Plan if outstanding stock awards granted under the 2002 Equity Incentive Plan and the 2011 Plan, after May 15, 2018, expire or terminate for any reason prior to exercise or settlement or are forfeited, cancelled or otherwise returned to us because of the failure to meet a contingency or condition required for the vesting of such shares, or, subject to certain exceptions, are reacquired or withheld (or not issued) by us to satisfy a tax withholding obligation in connection with a stock award. In May 2022, May 2021 and June 2020, our stockholders approved amendments to our 2018 Equity Incentive Plan to increase the total number of shares issuable under such plan by 11,000,000, 12,500,000 and 5,700,000 shares of our common stock, respectively.

Stock options granted under the 2018 Plan expire no later than ten years from the date of grant. Stock option exercise prices shall be equal to the fair market value of the underlying common stock on the date of grant. If, at the time we grant a stock option, the optionee directly or by attribution owns stock possessing more than 10% of the total combined voting power of all classes of our stock, the stock option exercise price shall be at least 110% of the

fair market value of the underlying common stock and shall not be exercisable more than five years after the date of grant.

We grant service-based and performance-based stock options to employees under the 2018 Plan. Service-based stock options generally vest over a period of four years from the date of the stock option grant. Performance-based stock options vest upon the achievement of specified milestones. Other stock awards (restricted stock awards and restricted stock units) have variable vesting schedules as determined by our board of directors on the date of grant.

Under certain circumstances, stock options may be exercised prior to vesting, subject to our right to repurchase the shares underlying such stock option at the exercise price paid per share. Our repurchase rights would generally terminate on a vesting schedule identical to the vesting schedule of the exercised stock option. During 2022 and 2021, we did not repurchase any shares under the 2018 Plan. As of December 31, 2022, we have no shares outstanding subject to repurchase under the 2018 Plan.

As of December 31, 2022, our Non-Employee Director Compensation Policy adopted by our board of directors in March 2014 and amended and restated in February and March 2022 provides for the automatic grant to non-employee directors of the following types of equity awards under the 2018 Plan:

First Director Option. Each person who becomes a non-employee director, whether by election by our stockholders or by appointment by our board of directors to fill a vacancy, will automatically be granted a stock option to purchase 200,000 shares of common stock, or First Director Option, on the date such person first becomes a non-employee director. The First Director Option vests annually over three years upon each anniversary date of appointment to our board of directors.

Subsequent Director Option. Each non-employee director (other than any director receiving a First Director Option on the date of the annual meeting) will automatically be granted a subsequent stock option to purchase 125,000 shares of common stock, a Subsequent Director Option, on the date of the annual meeting of stockholders in each year during such director's service on our board of directors. The Subsequent Director Option vests in full on the earlier of: (i) the date of the next annual meeting of our stockholders or (ii) the first anniversary of the date of grant.

2006 Directors' Stock Option Plan

The 2006 Directors' Stock Option Plan, or 2006 Directors Plan, was terminated by our board of directors and replaced by the 2011 Plan in March 2014. No further grants of stock options were made from the 2006 Directors Plan upon the 2006 Directors Plan's termination. All outstanding awards granted under the 2006 Directors Plan remain subject to the terms of the 2006 Directors Plan and the individual award agreements thereunder.

The stock options granted to non-employee directors under the 2006 Directors Plan were nonstatutory stock options, and they expire no later than ten years from the date of grant. The option exercise price was equal to the fair market value of the underlying common stock on the date of grant. The first director option granted to non-employee directors under the 2006 Directors Plan vested annually over three years upon each anniversary date of appointment to the board of directors. The subsequent director option granted to non-employee directors on the date of the annual meeting of stockholders in each year during such director's service on our board of directors under the 2006 Directors Plan vested one year from the date of grant.

2018 Inducement Award Plan

In December 2018, our board of directors approved the adoption of the 2018 Inducement Award Plan, or the Inducement Plan, pursuant to which we reserved 3,000,000 shares of our common stock to be used exclusively for grants of inducement awards to individuals who were not previously Geron employees or non-employee directors, other than following a bona fide period of non-employment. As of December 31, 2022, an aggregate total of 21,100,000 shares of common stock have been reserved under the Inducement Plan.

The Inducement Plan provides for the grant of nonstatutory stock options, stock appreciation rights, restricted stock awards, restricted stock units and other stock awards, and all awards under the Inducement Plan are intended to meet the standards under Rule 5635(c)(4) of the Nasdaq Listing Rules. The terms and conditions of the

Inducement Plan and the inducement awards to be granted thereunder are substantially similar to our stockholder-approved 2018 Plan.

Directors' Market Value Stock Purchase Plan

In October 2018, our board of directors adopted a Directors' Market Value Stock Purchase Plan, or the Directors Market Plan. A total of 1,000,000 shares of our common stock has been reserved for the Directors Market Plan. Under the Directors Market Plan, non-employee directors may purchase shares of our common stock at the prevailing market price on the purchase date with cash compensation payable to them for their services as a board member. As stated in Geron's Non-Employee Director Compensation Policy, each non-employee director receives annual cash compensation, payable quarterly in arrears, for their services on the board and various committees of the board. As provided in the Non-Employee Director Compensation Policy, a non-employee director may elect to receive fully vested shares of common stock in lieu of cash and such shares shall be issuable from the Directors Market Plan.

For the years ended December 31, 2022, 2021 and 2020, we issued 15,962, 20,783, and 17,986 shares of common stock, respectively, from the Directors Market Plan. The weighted average grant date fair value of stock granted during the years ended December 31, 2022, 2021 and 2020 was $1.92, $1.38 and $1.60 per share, respectively. The total fair value of vested stock grants during 2022, 2021 and 2020 was $29,000, $29,000 and $29,000, respectively.

Aggregate stock option and award activity for the 2011 Plan, 2018 Plan, 2006 Directors Plan, Inducement Plan and Directors Market Plan is as follows:

		Outstanding Stock Options			
	Shares Available For Grant	Number of Shares	Weighted Average Exercise Price Per Share	Weighted Average Remaining Contractual Life (In years)	Aggregate Intrinsic Value (In thousands)
Balance at December 31, 2021	18,763,393	49,952,409	$ 2.06		
Additional shares authorized	16,755,000	—	$ —		
Stock options granted	(19,747,760)	19,747,760	$ 1.37		
Awards granted	(15,962)	—	$ —		
Stock options exercised	—	(1,181,711)	$ 1.52		
Stock options cancelled/forfeited/expired	2,616,058	(2,616,058)	$ 1.70		
Balance at December 31, 2022	18,370,729	65,902,400 (1)	$ 1.87	6.56	$ 50,205
Stock options exercisable at December 31, 2022		36,085,389	$ 2.17	5.09	$ 22,878
Stock options fully vested and expected to vest at December 31, 2022		64,539,649	$ 1.88	6.52	$ 48,951

(1) Includes 8,791,750 performance-based stock options granted that have not achieved certain strategic milestones.

The aggregate intrinsic value in the preceding table represents the total intrinsic value, based on Geron's closing stock price of $2.42 per share as of December 31, 2022, which would have been received by the option holders had all the option holders exercised their stock options as of that date.

We have not granted any stock options with an exercise price below or greater than the fair market value of our common stock on the date of grant in 2022, 2021, and 2020. As of December 31, 2022, 2021 and 2020, there were 36,085,389, 30,459,136 and 25,721,508 exercisable stock options outstanding at weighted average exercise prices per share of $2.17, $2.35 and $2.54, respectively.

The total pretax intrinsic value of stock options exercised during 2022, 2021, and 2020 was $787,000, $93,000 and $17,000, respectively. Cash received from the exercise of stock options in 2022, 2021, and 2020 totaled approximately $1,799,000, $556,000 and $25,000, respectively.

Employee Stock Purchase Plan

In March 2014, our board of directors adopted the 2014 Employee Stock Purchase Plan, or 2014 Purchase Plan. The 2014 Purchase Plan was approved by our stockholders in May 2014. The 2014 Purchase Plan replaced the 1996 Employee Stock Purchase Plan, or 1996 Purchase Plan, which was terminated effective as of the date the 2014 Purchase Plan was approved by our stockholders. In May 2022, our stockholders approved an amendment to our 2014 Purchase Plan to increase the total number of shares issuable under such plan by 1,000,000 shares of our common stock, for an aggregate total reserve of 2,000,000 shares. As of December 31, 2022, an aggregate of 868,236 shares of our common stock have been issued under the 2014 Purchase Plan since its adoption.

The 2014 Purchase Plan is comprised of a series of offering periods, each with a maximum duration (not to exceed 12 months) with new offering periods commencing on January 1st and July 1st of each year. The date an employee enters the offering period will be designated as the entry date for purposes of that offering period. An employee may participate only in one offering period at a time. Each offering period consists of two consecutive purchase periods of six months' duration, with the last day of such period designated a purchase date.

Under the terms of the 2014 Purchase Plan, employees can choose to have up to 10% of their annual salary withheld to purchase our common stock. An employee may not make additional payments into such account or increase the withholding percentage during the offering period.

The purchase price per share at which common stock is purchased by the employee on each purchase date within the offering period is equal to 85% of the lower of (i) the fair market value per share of our common stock on the employee's entry date into that offering period or (ii) the fair market value per share of our common stock on the purchase date. If the fair market value per share of our common stock on the purchase date is less than the fair market value at the beginning of the offering period, a new 12 month offering period will automatically begin on the first business day following the purchase date with a new fair market value.

Stock-Based Compensation for Employees and Directors

We measure and recognize compensation expense for all share-based payment awards made to employees and directors, including employee stock options, restricted stock awards and employee stock purchases, based on grant-date fair values for these instruments. We use the Black Scholes option-pricing model to estimate the grant-date fair value of our service-based and performance-based stock options and employee stock purchases. The fair value for service-based restricted stock awards is determined using the fair value of our common stock on the date of grant.

As stock-based compensation expense recognized on the consolidated statements of operations for the years ended December 31, 2022, 2021 and 2020 is based on awards ultimately expected to vest, it has been reduced for estimated forfeitures, but at a minimum, reflects the grant-date fair value of those awards that actually vested in the period. Forfeitures have been estimated at the time of grant based on historical data and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates.

In 2022 and 2021, our board of directors awarded 2,741,750 and 550,000 performance-based stock options, respectively, to certain employees. These performance-based stock options are included in the outstanding stock options table above. Performance-based stock options vest only upon achievement of discrete strategic milestones. Stock-based compensation expense for performance-based stock options is recognized over the period from the date the performance condition is determined to be probable of occurring through the date the applicable condition is expected to be met and is reduced for estimated forfeitures, as applicable. If the performance condition is not considered probable of being achieved, no stock-based compensation expense is recognized until such time as the performance condition is considered probable of being achieved, if ever. None of the performance-based stock options have vested.

We recognize stock-based compensation expense for service-based stock options on a straight-line basis over the requisite service period, which is generally the vesting period. We have not recognized any stock-based compensation expense for performance-based stock options on our consolidated statements of operations for the years ended December 31, 2022, 2021 and 2020, as the achievement of the specified strategic milestones was not considered probable during that time. The following table summarizes the stock-based compensation expense related to service-based stock options and employee stock purchases for the years ended December 31, 2022, 2021 and 2020 which was allocated as follows:

	Year Ended December 31,		
(In thousands)	2022	2021	2020
Research and development	$ 3,720	$ 3,597	$ 2,337
General and administrative	4,281	4,483	4,558
Stock-based compensation expense included in operating expenses	$ 8,001	$ 8,080	$ 6,895

The fair value of stock options granted in 2022, 2021, and 2020 has been estimated at the date of grant using the Black Scholes option-pricing model with the following assumptions:

	Year Ended December 31,		
	2022	2021	2020
Dividend yield	0%	0%	0%
Expected volatility range	0.772 to 0.817	0.775 to 0.783	0.781 to 0.793
Risk-free interest rate range	1.69% to 4.57%	0.51% to 1.30%	0.31% to 1.62%
Expected term range	5.5 yrs	5.5 yrs	5.25 yrs

The fair value of employee stock purchases in 2022, 2021, and 2020 has been estimated using the Black Scholes option-pricing model with the following assumptions:

	Year Ended December 31,		
	2022	2021	2020
Dividend yield	0%	0%	0%
Expected volatility range	0.614 to 0.865	0.507 to 0.707	0.478 to 0.818
Risk-free interest rate range	0.40% to 2.79%	0.09% to 0.16%	0.16% to 1.57%
Expected term range	6 - 12 mos	6 - 12 mos	6 - 12 mos

Dividend yield is based on historical cash dividend payments and we have paid no cash dividends to date. The expected volatility range is based on historical volatilities of our stock, since traded options on our common stock do not correspond to option terms and the trading volume of options is limited. The risk-free interest rate range is based on the U.S. Zero Coupon Treasury Strip Yields for the expected term in effect on the date of grant for an award. The expected term of stock options is derived from actual historical exercise and post-vesting cancellation data and represents the period of time that stock options granted are expected to be outstanding. The expected term of employees' purchase rights is equal to the purchase period.

Based on the Black Scholes option-pricing model, the weighted average estimated fair value of stock options granted during the years ended December 31, 2022, 2021 and 2020 was $0.92, $1.17 and $0.88 per share, respectively. The weighted average estimated fair value of employees' purchase rights for the years ended December 31, 2022, 2021 and 2020 was $0.48, $0.56 and $0.62 per share, respectively. As of December 31, 2022, total compensation cost related to unvested share-based payment awards not yet recognized, net of estimated forfeitures and assuming no probability of achievement for outstanding performance-based stock options, was $17,791,000, which is expected to be recognized over the next 26 months on a weighted-average basis.

Stock-Based Compensation to Service Providers

We grant stock options to consultants from time to time in exchange for services performed for us. In general, the stock options vest over the contractual period of the consulting arrangement. The fair value of stock options held by consultants is recorded as operating expenses over the vesting term of the respective equity awards. With the adoption of Accounting Standards Update 2018-07, *Improvements to Nonemployee Share-Based Payment Accounting*, or ASU 2018-07, in the first quarter of 2019, the measurement date of stock options granted to consultants was fixed at the grant date. We recorded stock-based compensation expense of $235,000, $62,000 and $56,000 for the vested portion of the fair value of stock options held by consultants in 2022, 2021, and 2020, respectively.

Common Stock Reserved for Future Issuance

Common stock reserved for future issuance as of December 31, 2022 is as follows:

Outstanding stock options	65,902,400
Stock options and awards available for grant	18,370,729
Employee stock purchase plan	1,131,764
Warrants outstanding	106,254,842
Total	191,659,735

10. INCOME TAXES

The following table reconciles the federal statutory tax rate to the effective income tax rate from continuing operations:

	2022	2021	2020
Tax at statutory rate	21.0 %	21.0 %	21.0 %
State income tax, net of federal benefit	6.8	9.0	6.9
Federal and state tax credits	4.9	5.7	5.3
Stock-based compensation	(0.8)	(1.2)	(0.5)
Net operating loss not benefitted	(4.3)	(5.4)	(6.9)
Other	(0.1)	(0.2)	(0.3)
Change in valuation allowance	(27.5)	(28.9)	(25.5)
Effective tax rate	0.0 %	0.0 %	0.0 %

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of our deferred tax assets are as follows:

	December 31,	
	2022	2021
	(In thousands)	
Net operating loss carryforwards	$ 254,500	$ 241,300
Federal and state tax credits	56,700	49,600
Capitalized research and development	21,800	6,900
Stock-based compensation	10,800	10,200
Operating lease liabilities	1,300	1,400
Other	5,600	2,600
Total deferred tax assets	350,700	312,000
Less: valuation allowance	(349,600)	(310,700)
Net deferred tax assets	1,100	1,300
Operating leases, right-of-use assets	(1,100)	(1,300)
Total deferred tax liabilities	(1,100)	(1,300)
Total net deferred tax assets	$ —	$ —

We record net deferred tax assets to the extent we believe these assets will more likely than not be realized. In making such determination, we consider all available positive and negative evidence, including scheduled reversals

of deferred tax liabilities, projected future taxable income, tax planning strategies and recent financial performance. Forming a conclusion that a valuation allowance is not required is difficult when there is negative evidence such as cumulative losses in recent years. Because of our history of losses, the net deferred tax assets have been fully offset by a valuation allowance. The valuation allowance increased by $38,900,000 and $33,500,000 for the years ended December 31, 2022 and 2021, respectively.

As of December 31, 2022, we had domestic federal net operating loss carryforwards of approximately $993,100,000. Of this, $685,300,000 will expire at various dates beginning in 2023 through 2037 and the remaining will carryforward indefinitely under the new tax laws, but is subject to an 80% taxable income limitation for tax years beginning after 2020. As of December 31, 2022, we had state net operating loss carryforwards of approximately $658,400,000 expiring at various dates beginning in 2028 through 2041, if not utilized. We also had federal tax credit carryforwards of approximately $62,700,000 expiring at various dates beginning in 2023 through 2042, if not utilized. Our state tax credit carryforwards of approximately $20,900,000 carry forward indefinitely.

Utilization of net operating loss and tax credit carryforwards may be subject to an annual limitation due to ownership change limitations provided by the Internal Revenue Code and similar state provisions. Annual limitations may result in expiration of net operating loss and tax credit carryforwards before some or all of such amounts have been utilized. The impact of any limitations that may be imposed due to such ownership changes has not yet been determined.

In March and December 2020, in response to the COVID-19 pandemic, the Coronavirus Aid, Relief and Economic Security Act, or the CARES Act, and the Consolidated Appropriations Act, 2021 were passed into law and provide additional economic stimulus to address the impact of the COVID-19 pandemic, including among other items, several U.S. income tax provisions related to, among other things, net operating loss carrybacks, alternative minimum tax credits, modifications to interest expense limitations, and an option to defer payroll tax payments for a limited period. In 2021, we assessed our eligibility to claim a refund of employer taxes available under the Employee Retention Credit provisions of the CARES Act. For the years ended December 31, 2022 and 2021, we calculated eligible credits of approximately $483,000 and $1,152,000, respectively, provided by the CARES Act, which have been recognized as offsets to salaries costs in operating expenses in 2022 and 2021, respectively. As of December 31, 2022, the aggregate eligible credit amount has been accrued as a receivable on our consolidated balance sheets.

We adopted the provision of the standard for accounting for uncertainties in income taxes on January 1, 2007. Upon adoption, we recognized no material adjustment in the liability for unrecognized tax benefits. At December 31, 2022, we had approximately $23,700,000 of unrecognized tax benefits, none of which would currently affect our effective tax rate if recognized due to our net deferred tax assets being fully offset by a valuation allowance.

A reconciliation of the beginning and ending amounts of unrecognized tax benefits is as follows (in thousands):

Balance as of December 31, 2021	$	21,300
Decrease related to prior year tax positions		—
Increase related to current year tax positions		2,400
Balance as of December 31, 2022	$	23,700

If applicable, we would classify interest and penalties related to uncertain tax positions in income tax expense. Through December 31, 2022, there has been no interest expense or penalties related to unrecognized tax benefits.

We do not currently expect any significant changes to unrecognized tax benefits during the fiscal year ended December 31, 2023. In certain cases, our uncertain tax positions are related to tax years that remain subject to examination by the relevant tax authorities. Tax years for which we have carryforward net operating loss and credit attributes remain subject to examination by federal and most state tax authorities.

11. CONSOLIDATED STATEMENTS OF CASH FLOWS DATA

	Year Ended December 31,		
	2022	2021	2020
	(In thousands)		
Supplemental operating and investing activities:			
Net unrealized loss on marketable securities	$ (68)	$ (251)	$ (54)
Reclassification between prepaid and other current assets and deposits and other assets	(5)	—	—
Operating lease assets obtained in exchange for operating lease liabilities	—	—	3,575
Interest paid	$ 5,154	$ 2,704	$ 388

12. SUBSEQUENT EVENTS

Public Offering

On January 10, 2023, we completed an underwritten public offering of 68,007,741 shares of our common stock and a pre-funded warrant to purchase 25,000,000 shares of our common stock, or the 2023 pre-funded warrant. The net cash proceeds from this offering are approximately $213,300,000, after deducting the underwriting discount and other offering expenses paid by us, and excludes any future proceeds from the exercise of the 2023 pre-funded warrant, which has not been exercised.

Warrant Exercises

From January 1, 2023 through March 9, 2023, we have received $46,716,000 in cash proceeds from the exercise of the 2020 purchase warrants, representing 35,935,577 shares of our common stock.

From January 1, 2023 through March 9, 2023, we have received $13,119,000 in cash proceeds from the exercise of the 2022 purchase warrants, representing 9,047,617 shares of our common stock.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

(I) Evaluation of Disclosure Controls and Procedures

We have carried out an evaluation under the supervision and with the participation of management, including our Chief Executive Officer and our Chief Financial Officer, of our disclosure controls and procedures (as defined in Rule 13a-15(e) of the Securities Exchange Act of 1934, as amended) as of the end of the period covered by this annual report on Form 10-K. Based on that evaluation, our Chief Executive Officer and our Chief Financial Officer concluded that our disclosure controls and procedures were effective at the reasonable assurance level as of December 31, 2022.

In designing and evaluating disclosure controls and procedures, our management recognizes that any system of controls, however well designed and operated, can provide only reasonable assurance, and not absolute assurance, that the desired control objectives of the system are met. In addition, the design of any control system is based in part upon certain assumptions about the likelihood of future events. Because of these and other inherent limitations of control systems, there can be no assurance that any design will succeed in achieving its stated goals in all future circumstances. Accordingly, our disclosure controls and procedures are designed to provide reasonable, not absolute, assurance that the objectives of our disclosure control system are met and, as set forth above, our Chief Executive Officer and our Chief Financial Officer have concluded, based on their evaluation as of the end of the period covered by this annual report on Form 10-K, that our disclosure controls and procedures were effective to provide reasonable assurance that the objectives of our disclosure control system were met.

(II) Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting during the quarter ended December 31, 2022 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

(III) Management's Report on Internal Control over Financial Reporting

Internal control over financial reporting refers to the process designed by, or under the supervision of, our Chief Executive Officer and Chief Financial Officer, and effected by our board of directors, management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles, and includes those policies and procedures that:

(1) Pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of our assets;

(2) Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and

(3) Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on the financial statements.

Management is responsible for establishing and maintaining an adequate internal control over financial reporting for us. Internal control over financial reporting cannot provide absolute assurance of achieving financial reporting objectives because of its inherent limitations. Internal control over financial reporting is a process that involves human diligence and compliance and is subject to lapses in judgment and breakdowns resulting from human failures. Internal control over financial reporting also can be circumvented by collusion or improper management override. Because of such limitations, there is a risk that material misstatements may not be prevented or detected on a timely basis by internal control over financial reporting. However, these inherent limitations are known features of the financial reporting process. Therefore, it is possible to design into the process safeguards to reduce, though not eliminate, this risk.

Under the supervision and with the participation of our management, including our Chief Executive Officer and our Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting based on the framework set forth in "Internal Control—Integrated Framework" issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework). Based on our evaluation under the framework set forth in "Internal Control—Integrated Framework," our management concluded that our internal control over financial reporting was effective as of December 31, 2022.

(IV) Report of Independent Registered Public Accounting Firm

This annual report on Form 10-K does not include an attestation report of our independent registered public accounting firm. Our independent registered public accounting firm will not be required to formally attest to the effectiveness of our internal control over financial reporting as long as we are a smaller reporting company pursuant to the provisions of Rule 12b-2 of the Exchange Act.

ITEM 9B. OTHER INFORMATION

None.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

PART III

Certain information required by Part III is omitted from this annual report on Form 10-K because we will file with the U.S. Securities and Exchange Commission a definitive proxy statement pursuant to Regulation 14A in connection with the solicitation of proxies for Geron's Annual Meeting of Stockholders expected to be held in May 2023, or the Proxy Statement, not later than 120 days after the end of the fiscal year covered by this annual report on Form 10-K, and certain information included therein is incorporated herein by reference, or an amendment to this annual report on Form 10-K under cover of Form 10-K/A containing the information required by this Part III.

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Identification of Directors and Nominees for Director

The information required by this item concerning our directors and nominees for director is incorporated by reference from the section captioned "Proposal 1: Election of Directors" contained in our Proxy Statement.

Identification of Executive Officers

The information required by this item concerning our executive officers is set forth in Part I, Item 1 of this annual report on Form 10-K.

Code of Ethics

We have adopted a Code of Conduct with which every person who works for Geron, including our board of directors, is expected to comply. The Code of Conduct is publicly available on our website under the Investors & Media section at www.geron.com. This website address is intended to be an inactive, textual reference only; none of the material on this website is part of this annual report on Form 10-K. If any substantive amendments are made to the Code of Conduct or any waiver granted, including any implicit waiver, from a provision of the Code of Conduct to our Chief Executive Officer, Chief Financial Officer or Corporate Controller, we will disclose the nature of such amendment or waiver on that website or in a report on Form 8-K.

Copies of the Code of Conduct will be furnished without charge to any person who submits a written request directed to the attention of our Corporate Secretary, at our offices located at 919 East Hillsdale Boulevard, Suite 250, Foster City, California, 94404.

Certain Corporate Governance Matters

The information required by this item concerning our audit committee, audit committee financial expert and procedures by which stockholders may recommend nominees to our board of directors, may be found under the sections captioned "Board Leadership and Governance" and "Other Matters" contained in the Proxy Statement.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this item is incorporated by reference from the sections captioned "Summary Compensation Table and Narrative Disclosure to Summary Compensation Table," and "Compensation of Directors" contained in the Proxy Statement.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this item is incorporated by reference from the sections captioned "Equity Compensation Plan Information" and "Security Ownership of Certain Beneficial Owners and Management" contained in the Proxy Statement.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this item is incorporated by reference from the sections captioned "Proposal 1: Election of Directors" and "Certain Transactions" contained in the Proxy Statement.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this item is incorporated by reference from the section captioned "Principal Accountant Fees and Services" contained in the Proxy Statement.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) (1) Financial Statements

Included in Part II, Item 8 of this Report:

(2) Financial Statement Schedules

Financial statement schedules are omitted because they are not required or the information is disclosed in the financial statements listed in Item 15(a)(1) above.

(3) Exhibits

Exhibit Number	Description	Incorporation by Reference			
		Exhibit Number	Filing	Filing Date	File No.
2.1	Asset Contribution Agreement by and among Geron Corporation, BioTime, Inc. and Asterias Biotherapeutics, Inc. (formerly known as BioTime Acquisition Corporation)	2.1	8-K	January 8, 2013	000-20859
3.1	Restated Certificate of Incorporation	3.3	8-K	May 18, 2012	000-20859
3.2	Certificate of Amendment of the Restated Certificate of Incorporation	3.1	8-K	May 18, 2012	000-20859
3.3	Certificate of Amendment of the Restated Certificate of Incorporation	3.1	8-K	June 7, 2019	000-20859
3.4	Certificate of Amendment of the Restated Certificate of Incorporation	3.1	8-K	May 13, 2021	000-20859
3.5	Amended and Restated Bylaws of Registrant	3.1	8-K	March 19, 2010	000-20859
3.6	Amendment to Amended and Restated Bylaws of Registrant	3.4	8-K	November 22, 2017	000-20859
4.1	Description of Capital Stock	4.1	10-K	March 10, 2022	000-20859
4.2	Form of Common Stock Certificate	4.1	10-K	March 15, 2013	000-20859
4.3	Form of Pre-Funded Warrant to Purchase Common Stock	4.1	8-K	May 26, 2020	000-20859
4.4	Form of Warrant to Purchase Common Stock	4.2	8-K	May 26, 2020	000-20859
4.5	Form of Pre-Funded Warrant to Purchase Common Stock	4.1	8-K	March 30, 2022	000-20859
4.6	Form of Warrant to Purchase Common Stock	4.2	8-K	March 30, 2022	000-20859
4.7	Form of Pre-Funded Warrant to Purchase Common Stock	4.1	8-K	January 6, 2023	000-20859
10.1	Form of Indemnification Agreement	10.1	10-K	March 7, 2012	000-20859
10.2	Amended and Restated 2006 Directors' Stock Option Plan*	10.5	10-Q	November 7, 2013	000-20859
10.3	2011 Incentive Award Plan*	10.1	8-K	May 16, 2011	000-20859
10.4	Form of Stock Option Agreement under 2011 Incentive Award Plan*	10.11	10-K	March 15, 2013	000-20859
10.5	Form of Restricted Stock Award Agreement under 2011 Incentive Award Plan*	10.12	10-K	March 15, 2013	000-20859
10.6	Form of Non-Employee Director Stock Option Agreement under 2011 Incentive Award Plan*	10.2	10-Q	May 7, 2015	000-20859
10.7	2018 Equity Incentive Plan, as amended*	10.1	8-K	May 13, 2022	000-20859
10.8	UK Sub-Plan to 2018 Equity Incentive Plan*	10.1	10-Q	November 7, 2022	000-20859
10.9	Form of 2018 Equity Incentive Plan Option Agreement (Time Based)*	10.2	10-Q	November 7, 2022	000-20859
10.10	Form of 2018 Equity Incentive Plan Option Agreement (Performance Based)*	10.2	10-Q	November 7, 2022	000-20859
10.11	Form of Non-Employee Director Stock Option Agreement under 2018 Equity Incentive Plan*	10.4	8-K	May 18, 2018	000-20859
10.12	Form of Non-Employee Director Stock Option Agreement under 2018 Equity Incentive Plan, as amended*	10.13	10-K	March 7, 2019	000-20859
10.13	Form of Performance-Vesting Stock Option Agreement under 2018 Equity Incentive Plan*	10.14	10-K	March 7, 2019	000-20859
10.14	Form of Performance-Vesting Stock Option Agreement under 2018 Equity Incentive Plan, as amended*	10.15	10-K	March 7, 2019	000-20859
10.15	2018 Inducement Award Plan, as amended July 15, 2022*	10.3	10-Q	August 11, 2022	000-20859
10.16	UK Sub-Plan to 2018 Inducement Award Plan*	10.5	10-Q	November 7, 2022	000-20859
10.17	Form of Stock Option Agreement under 2018 Inducement Award Plan*	10.2	8-K	December 14, 2018	000-20859

		Incorportion by Reference			
Exhibit Number	**Description**	**Exhibit Number**	**Filing**	**Filing Date**	**File No.**
10.18	Form of Stock Option Agreement under 2018 Inducement Award Plan, as amended*	10.19	10-K	March 7, 2019	000-20859
10.19	Form of Performance-Vesting Stock Option Agreement under 2018 Inducement Award Plan*	10.20	10-K	March 7, 2019	000-20859
10.20	2014 Employee Stock Purchase Plan, as amended*	10.2	8-K	May 13, 2022	000-20859
10.21	Form of 2018 Inducement Award Plan Option Agreement (Time Based)*	10.6	10-Q	November 7, 2022	000-20859
10.22	Form of 2018 Inducement Award Plan Option Agreement (Performance Based)*	10.7	10-Q	November 7, 2022	000-20859
10.23	Non-Employee Director Compensation Policy, as amended February 16, 2022 and March 7, 2022*	10.20	10-K	March 10, 2022	000-20859
10.24	Directors' Market Value Stock Purchase Plan, effective October 1, 2018*	10.1	10-Q	November 1, 2018	000-20859
10.25	Amended and Restated Severance Plan, effective as of January 1, 2022*	10.22	10-K	March 10, 2022	000-20859
10.26	Amended and Restated Employment Agreement between the Registrant and John A. Scarlett, M.D., effective as of January 31, 2019*	10.29	10-K	March 7, 2019	000-20859
10.27	Amended and Restated Employment Agreement between the Registrant and Andrew J. Grethlein, effective as of January 31, 2019*	10.31	10-K	March 7, 2019	000-20859
10.28	Amended and Restated Employment Agreement between the Registrant and Olivia K. Bloom, effective as of January 31, 2019*	10.32	10-K	March 7, 2019	000-20859
10.29	Employment Agreement between the Registrant and Anil Kapur, effective as of December 2, 2019*	10.33	10-K	March 12, 2020	000-20859
10.30	Office Lease Agreement by and between Registrant and 3 Sylvan Realty LLC, effective as of April 30, 2019	10.18	10-Q	May 2, 2019	000-20859
10.31	Office Lease Agreement by and between Registrant and Hudson Metro Center LLC, effective as of October 9, 2019	10.1	8-K	October 15, 2019	000-20859
10.32	At Market Issuance Sales Agreement, dated September 4, 2020, by and between Registrant and B. Riley Securities, Inc.	10.1	8-K	September 4, 2020	000-20859
10.33†	Loan and Security Agreement, dated September 30, 2020, amongst Registrant, Hercules Capital, Inc., and Silicon Valley Bank	10.1	10-Q	November 5, 2020	000-20859
10.34†	Amendment to Loan and Security Agreement, dated August 12, 2021, amongst Registrant, Hercules Capital, Inc., and Silicon Valley Bank	10.1	10-Q	August 16, 2021	000-20859
10.35†	Second Amendment to Loan and Security Agreement, dated June 30, 2022 amongst Registrant, Hercules Capital, Inc., and Silicon Valley Bank	10.4	10-Q	August 11, 2022	000-20859
21.1	List of Subsidiaries				
23.1	Consent of Independent Registered Public Accounting Firm				
24.1	Power of Attorney (see signature page)				

		Incorporation by Reference			
Exhibit Number	Description	Exhibit Number	Filing	Filing Date	File No.
31.1	Certification of Chief Executive Officer pursuant to Form of Rule 13a-14(a), as Adopted Pursuant to Section 302(a) of the Sarbanes-Oxley Act of 2002, dated March 16, 2023				
31.2	Certification of Chief Financial Officer pursuant to Form of Rule 13a-14(a), as Adopted Pursuant to Section 302(a) of the Sarbanes-Oxley Act of 2002, dated March 16, 2023				
32.1	Certification of Chief Executive Officer pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, dated March 16, 2023**				
32.2	Certification of Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, dated March 16, 2023**				
101	The following materials from the Registrant's annual report on Form 10-K for the year ended December 31, 2022, formatted in Inline Extensible Business Reporting Language (iXBRL) include: (i) Consolidated Balance Sheets as of December 31, 2022 and 2021, (ii) Consolidated Statements of Operations, Consolidated Comprehensive Loss, Stockholders' Equity and Cash Flows for each of the three years in the period ended December 31, 2022, and (iii) Notes to Consolidated Financial Statements				
104	Cover Page Interactive Data File (embedded within the Inline XBRL document)				

† Confidential treatment has been granted for certain portions of this exhibit. Omitted information has been filed separately with the Securities and Exchange Commission.

* Management contract or compensation plan or arrangement.

** The certifications attached as Exhibits 32.1 and 32.2 that accompany this annual report on Form 10-K, are not deemed filed with the Securities and Exchange Commission and are not 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 of this annual report on Form 10-K), irrespective of any general incorporation language contained in such filing.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

GERON CORPORATION

Date: March 16, 2023

By: /s/ OLIVIA BLOOM
OLIVIA K. BLOOM
Executive Vice President, Finance,
Chief Financial Officer and Treasurer

POWER OF ATTORNEY

KNOW BY ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints, jointly and severally, John A. Scarlett, M.D., and Olivia K. Bloom, and each one of them, attorneys-in-fact for the undersigned, each with the power of substitution, for the undersigned in any and all capacities, to sign any and all amendments to this annual report on Form 10-K, and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that each of said attorneys-in-fact, or his or her substitutes, may do or cause to be done by virtue hereof.

IN WITNESS WHEREOF, each of the undersigned has executed this Power of Attorney as of the date indicated opposite his/her name.

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ JOHN A. SCARLETT JOHN A. SCARLETT	President, Chief Executive Officer and Chairman of the Board (Principal Executive Officer)	March 16, 2023
/s/ OLIVIA BLOOM OLIVIA K. BLOOM	Executive Vice President, Finance, Chief Financial Officer and Treasurer (Principal Financial and Accounting Officer)	March 16, 2023
/s/ DAWN C. BIR DAWN C. BIR	Director	March 16, 2023
/s/ KARIN EASTHAM KARIN EASTHAM	Director	March 16, 2023
/s/ V. BRYAN LAWLIS V. BRYAN LAWLIS	Director	March 16, 2023
/s/ JOHN MCDONALD JOHN F. McDONALD	Director	March 16, 2023
/s/ SUSAN MOLINEAUX SUSAN M. MOLINEAUX	Director	March 16, 2023
/s/ ELIZABETH G. O'FARRELL ELIZABETH G. O'FARRELL	Director	March 16, 2023
/s/ ROBERT J. SPIEGEL ROBERT J. SPIEGEL	Director	March 16, 2023

EXHIBIT 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the following Registration Statements:

1) Registration Statement (Form S-3, No. 333-248637) and in the related prospectuses and prospectus supplements,
2) Registration Statements (Form S-3, Nos. 333-225184 and 333-238595) and in the related prospectuses and prospectus supplements,
3) Registration Statement (Form S-3ASR, No. 333-269111) and in the related prospectuses and prospectus supplements,
4) Registration Statements (Form S-8, Nos. 333-239324 and 333-258864) pertaining to the 2018 Inducement Award Plan and the 2018 Equity Incentive Plan,
5) Registration Statement (Form S-8, No. 333-230171) pertaining to the 2018 Inducement Award Plan,
6) Registration Statement (Form S-8, No. 333-228147) pertaining to the Directors' Market Value Stock Purchase Plan,
7) Registration Statement (Form S-8, No. 333-225190) pertaining to the 2018 Equity Incentive Plan,
8) Registration Statement (Form S-8, No. 333-196677) pertaining to the 2014 Employee Stock Purchase Plan,
9) Registration Statement (Form S-8, No. 333-174350) pertaining to the 2011 Incentive Award Plan, the 2002 Equity Incentive Plan, the 1996 Directors' Stock Option Plan and the 1992 Stock Option Plan,
10) Registration Statement (Form S-8, No. 333-136330) pertaining to the 2002 Equity Incentive Plan and the 2006 Directors' Stock Option Plan; and
11) Registration Statement (Form S-8, No. 333-266795) pertaining to the 2018 Equity Incentive Plan, the 2018 Inducement Award Plan and the 2014 Employee Stock Purchase Plan.

of our report dated March 16, 2023, with respect to the consolidated financial statements of Geron Corporation included in this Annual Report (Form 10-K) of Geron Corporation for the year ended December 31, 2022.

/s/ Ernst & Young LLP

San Jose, California
March 16, 2023

EXHIBIT 31.1

CERTIFICATION PURSUANT TO
FORM OF RULE 13A-14(A)
AS ADOPTED PURSUANT TO
SECTION 302(A) OF THE SARBANES-OXLEY ACT OF 2002

I, John A. Scarlett, M.D., certify that:

1. I have reviewed this annual report on Form 10-K of Geron Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 16, 2023

/s/ JOHN A. SCARLETT
JOHN A. SCARLETT, M.D.
President, Chief Executive Officer and Chairman of the Board

EXHIBIT 31.2

CERTIFICATION PURSUANT TO
FORM OF RULE 13A-14(A)
AS ADOPTED PURSUANT TO
SECTION 302(A) OF THE SARBANES-OXLEY ACT OF 2002

I, Olivia K. Bloom, certify that:

1. I have reviewed this annual report on Form 10-K of Geron Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 16, 2023

/s/ OLIVIA BLOOM
OLIVIA K. BLOOM
Executive Vice President, Finance,
Chief Financial Officer and Treasurer

EXHIBIT 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to 18 U.S.C. Section 1350, as created by Section 906 of the Sarbanes-Oxley Act of 2002, the undersigned officer of Geron Corporation (the "Company") hereby certifies, to such officer's knowledge, that:

(i) the accompanying annual report on Form 10-K of the Company for the year ended December 31, 2022 (the "Report") fully complies with the requirements of Section 13(a) or Section 15(d), as applicable, of the Securities Exchange Act of 1934, as amended; and

(ii) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: March 16, 2023

/s/ JOHN A. SCARLETT
JOHN A. SCARLETT, M.D.
President, Chief Executive Officer and Chairman of the Board

This certification accompanies the Form 10-K to which it relates, is not deemed filed with the Securities and Exchange Commission and is not 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 of the Form 10-K), irrespective of any general incorporation language contained in such filing.

EXHIBIT 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

Pursuant to 18 U.S.C. Section 1350, as created by Section 906 of the Sarbanes-Oxley Act of 2002, the undersigned officer of Geron Corporation (the "Company") hereby certifies, to such officer's knowledge, that:

(i) the accompanying annual report on Form 10-K of the Company for the year ended December 31, 2022 (the "Report") fully complies with the requirements of Section 13(a) or Section 15(d), as applicable, of the Securities Exchange Act of 1934, as amended; and

(ii) the information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Dated: March 16, 2023

/s/ OLIVIA BLOOM
OLIVIA K. BLOOM
Executive Vice President, Finance,
Chief Financial Officer and Treasurer

This certification accompanies the Form 10-K to which it relates, is not deemed filed with the Securities and Exchange Commission and is not 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 of the Form 10-K), irrespective of any general incorporation language contained in such filing.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USE OF FORWARD-LOOKING STATEMENTS

Except for the historical information contained herein, the Letter to Stockholders contains forward-looking statements made pursuant to the "safe harbor" provisions of the Private Securities Litigation Reform Act of 1995. Investors are cautioned that such statements, include, without limitation, those regarding: (i) that Geron plans regulatory submissions in the U.S. in mid-2023 and the EU in the second half of 2023, and is preparing for potential regulatory approvals and commercial launches in lower risk MDS in the U.S. in the first half of 2024 and in the EU by the end of 2024; (ii) that for IMpactMF, Geron expects to conduct an interim analysis in 2024 and a final analysis in 2025; (iii) that IMerge Phase 3 and IMpactMF have registrational intent; (iv) that there is strong evidence of potential disease modification achieved with imetelstat; (v) that imetelstat may alter the underlying drivers of hematologic malignancies, which would clearly distinguish imetelstat as a potential treatment option for these diseases; (vi) that there are unmet needs in lower risk MDS and relapsed /refractory MF potentially addressed with imetelstat treatment; (vii) that the telomerase inhibition activity of imetelstat gives it the potential for expanding into new indications; (viii) that the Company expects to present preliminary results from IMproveMF by the end of 2023; (ix) that the planned first site opening for IMpress is in 2023; (x) that if the data from IMpress shows promise, the Company expects to support another investigator-led study; (xi) that the Company expects further experiments from the preclinical program in lymphoid malignancies and further data by the end of 2023; (xii) that the Company expects completion of the current oral telomerase inhibitor discovery effort in 2023 and plans to potentially advance any lead compounds to the next step in discovery research; and (xiii) other statements that are not historical facts, constitute forward-looking statements. These forward-looking statements involve risks and uncertainties that can cause actual results to differ materially from those in such forward-looking statements. These risks and uncertainties, include, without limitation, risks and uncertainties related to: (a) the impact of general economic, industry or political climate in the U.S. or internationally, the current or evolving effects of macroeconomic conditions, such as the COVID-19 pandemic, civil or political unrest or military conflicts around the world, such as the military conflict between Ukraine and Russia, inflation, rising interest rates or prospects of a recession, on Geron's business and business prospects, its financial condition and the future of imetelstat; (b) whether Geron overcomes all of the potential delays and other adverse impacts caused by the current or evolving effects of the COVID-19 pandemic and/or geopolitical events, as well as all the enrollment, clinical, safety, efficacy, technical, scientific, intellectual property, manufacturing and regulatory challenges in order to have the financial resources for, and to meet the expected timelines and planned milestones in (i) to (ii) and (viii) to (xii) above; (c) whether regulatory authorities accept for filing Geron's planned New Drug Application and Marketing Authorization Application submissions and permit the further development of imetelstat on a timely basis, or at all, without any clinical holds; (d) whether imetelstat is demonstrated to be safe and efficacious in IMerge Phase 3 and IMpactMF to enable regulatory approval; (e) whether any future efficacy or safety results may cause the benefit-risk profile of imetelstat to become unacceptable; (f) whether imetelstat actually demonstrates disease-modifying activity in patients and the ability to target the malignant stem and progenitor cells of the underlying disease; (g) that Geron may seek to raise substantial additional capital in order to complete the development and commercialization of imetelstat and to meet all of the expected timelines and planned milestones in (i) to (ii) and (viii) to (xii) above; (h) whether regulatory authorities require additional clinical testing of imetelstat prior to or after granting approval in lower risk MDS even though IMerge Phase 3 met its primary endpoint; (i) whether there are failures in manufacturing or supplying sufficient quantities of imetelstat that would delay, or not permit, the anticipated launches in (i) above or not enable or delay the other ongoing or planned clinical trials; (j) whether imetelstat is able to obtain and maintain the exclusivity terms and scopes provided by patents and patent term extensions, orphan drug, data and marketing and pediatric coverages and have freedom to operate; (k) whether the follow-up period of 12 months for the IMerge Phase 3 primary analysis results in not obtaining adequate data to demonstrate safety and efficacy, including transfusion independence, to enable regulatory approval; (l) whether Geron can accurately project the timing of complete enrollment in its clinical trials, whether due to the current or evolving effects of the COVID-19 pandemic and/or geopolitical events or otherwise; (m) whether Geron is able to enroll its clinical trials at a pace that would enable the financial resources for, and to meet the expected timelines and planned milestones in (i) to (ii) and (viii) to (xii) above; (n) that Geron may be unable to successfully commercialize imetelstat due to competitive products, or otherwise; (o) if the FDA does not approve imetelstat on a timely basis, then the launch date in lower risk MDS may be later than the first half of 2024; (p) whether Geron may decide to partner and not to commercialize independently in the U.S. and in key European markets; and (q) for IMpactMF, Geron's projected rates for enrollment and death events may differ from actual rates, which may cause the interim analysis to occur later than 2024 and the final analysis to occur later than 2025. Additional information on the above risks and uncertainties and additional risks, uncertainties and factors that could cause actual results to differ materially from those in the forward-looking statements are contained under the heading "Risk Factors" or other similar headings found in documents Geron files from time to time with the Securities and Exchange Commission (the "SEC"), including the Company's annual report on Form 10-K for the year ended December 31, 2022 and subsequent filings. Undue reliance should not be placed on forward-looking statements, which speak only as of the date they are made, and the facts and assumptions underlying the forward-looking statements may change. Except as required by law, Geron disclaims any obligation to update these forward-looking statements to reflect future information, events or circumstances.

Corporate information

BOARD OF DIRECTORS

John A. Scarlett, M.D.
Chairman of the Board

Dawn C. Bir

Karin Eastham
Lead Independent Director

V. Bryan Lawlis, Ph.D.

John F. McDonald

Susan M. Molineaux, Ph.D.

Elizabeth G. O'Farrell

Robert J. Spiegel, M.D., FACP

EXECUTIVE MANAGEMENT

John A. Scarlett, M.D.
Chairman of the Board,
President and Chief Executive Officer

Olivia K. Bloom
Executive Vice President, Finance,
Chief Financial Officer and Treasurer

Faye Feller, M.D.
Executive Vice President,
Chief Medical Officer

Andrew J. Grethlein, Ph.D.
Executive Vice President,
Chief Operating Officer

Anil Kapur
Executive Vice President, Corporate
Strategy and Chief Commercial Officer

Melissa A. Kelly Behrs
Executive Vice President, Business
Operations and Chief Alliance Officer

Edward E. Koval
Executive Vice President,
Chief Business Officer

Stephen N. Rosenfield
Executive Vice President, Chief
Legal Officer and Corporate Secretary

INVESTOR RELATIONS

investor@geron.com

TRANSFER AGENT & REGISTRAR

Computershare Investor Services
PO Box 505005
Louisville, KY 40233-5005
Tel: (800) 962-4284

INDEPENDENT AUDITORS

Ernst & Young LLP
303 Almaden Boulevard
San Jose, CA 95110

LEGAL COUNSEL

Cooley LLP
3 Embarcadero Center, 20th Floor
San Francisco, CA 94111-4004

STOCK LISTING

Geron Corporation
common stock trades on the
Nasdaq Global Select Market under
the ticker symbol GERN

geron

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Fax: (650) 473-7750
Internet: www.geron.com
Email: info@geron.com