UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON D.C. 20549

FORM 10-Q

(Mark One)

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

For the quarterly period ended June 30, 2021

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 BOULEVARD, SUITE 250, FOSTER CITY, CA	**94404**
(Address of principal executive offices)	**(Zip Code)**

(650) 473-7700

(Registrant's telephone number, including area code)

N/A

(Former name, former address and former fiscal year, if changed since last report)

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

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, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

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

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

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

Indicate the number of shares outstanding of each of the issuer's classes of common stock, as of the latest practicable date.

Class:	**Outstanding at August 11, 2021:**
Common Stock, $0.001 par value	320,599,195 shares

GERON CORPORATION

QUARTERLY REPORT ON FORM 10-Q

FOR THE QUARTER ENDED JUNE 30, 2021

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PART I. FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS (UNAUDITED)

GERON CORPORATION
CONDENSED BALANCE SHEETS
(IN THOUSANDS)

	JUNE 30, 2021 (UNAUDITED)	DECEMBER 31, 2020 (NOTE 1)
ASSETS		
Current assets:		
Cash and cash equivalents	$ 57,282	$ 9,925
Restricted cash	363	363
Marketable securities	140,959	186,350
Interest and other receivables	714	722
Prepaid and other current assets	2,444	2,497
Total current assets	201,762	199,857
Noncurrent marketable securities	40,521	63,387
Property and equipment, net	590	658
Operating leases, right-of-use assets	5,029	5,295
Deposits and other assets	4,273	1,531
	$ 252,175	$ 270,728
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 3,758	$ 6,919
Accrued compensation and benefits	5,216	8,218
Operating lease liabilities	889	878
Accrued liabilities	27,150	14,925
Total current liabilities	37,013	30,940
Noncurrent operating lease liabilities	4,540	4,799
Noncurrent debt	34,416	24,042
Commitments and contingencies		
Stockholders' equity:		
Common stock	321	310
Additional paid-in capital	1,388,909	1,366,188
Accumulated deficit	(1,213,027)	(1,155,629)
Accumulated other comprehensive gain	3	78
Total stockholders' equity	176,206	210,947
	$ 252,175	$ 270,728

See accompanying notes.

GERON CORPORATION
CONDENSED STATEMENTS OF OPERATIONS
(IN THOUSANDS, EXCEPT SHARE AND PER SHARE DATA)
(UNAUDITED)

	THREE MONTHS ENDED JUNE 30,		SIX MONTHS ENDED JUNE 30,	
	2021	2020	2021	2020
Revenues:				
License fees and royalties	$ 107	$ 43	$ 244	$ 95
Operating expenses:				
Research and development	21,937	10,845	43,050	21,647
General and administrative	7,059	5,960	14,537	12,080
Total operating expenses	28,996	16,805	57,587	33,727
Loss from operations	(28,889)	(16,762)	(57,343)	(33,632)
Interest income	136	475	309	1,229
Interest expense	(804)	—	(1,547)	—
Change in fair value of equity investment	—	422	—	227
Other income and (expense), net	(17)	41	1,183	(3)
Net loss	$ (29,574)	$ (15,824)	$ (57,398)	$ (32,179)
Basic and diluted net loss per share	$ (0.09)	$ (0.06)	$ (0.18)	$ (0.14)
Shares used in computing basic and diluted net loss per share	327,026,907	246,966,143	325,342,161	223,594,118

See accompanying notes.

GERON CORPORATION
CONDENSED STATEMENTS OF COMPREHENSIVE LOSS
(IN THOUSANDS)
(UNAUDITED)

	THREE MONTHS ENDED JUNE 30,		SIX MONTHS ENDED JUNE 30,	
	2021	2020	2021	2020
Net loss	$ (29,574)	$ (15,824)	$ (57,398)	$ (32,179)
Net unrealized (loss) gain on marketable securities, net of taxes	(32)	313	(75)	57
Comprehensive loss	$ (29,606)	$ (15,511)	$ (57,473)	$ (32,122)

See accompanying notes.

GERON CORPORATION
CONDENSED STATEMENTS OF STOCKHOLDERS' EQUITY
(IN THOUSANDS, EXCEPT SHARE DATA)
(UNAUDITED)

	Common Stock		Additional Paid-In	Accumulated	Accumulated Other Comprehensive	Total Stockholders'
	Shares	Amount	Capital	Deficit	Gain (Loss)	Equity
Balance at December 31, 2020	310,566,853	$ 310	$ 1,366,188	$ (1,155,629)	$ 78	$ 210,947
Net loss	—	—	—	(27,824)	—	(27,824)
Other comprehensive loss	—	—	—	—	(43)	(43)
Issuance of common stock in connection with at market offering, net of issuance costs of $374	7,948,505	8	16,226	—	—	16,234
Stock-based compensation related to issuance of common stock and options in exchange for services	4,549	—	25	—	—	25
Issuance of common stock in connection with exercise of warrants	8,869	—	12	—	—	12
Issuance of common stock under equity plans	16,232	—	17	—	—	17
Stock-based compensation for equity-based awards to employees and directors	—	—	1,794	—	—	1,794
Balance at March 31, 2021	318,545,008	318	1,384,262	(1,183,453)	35	201,162
Net loss	—	—	—	(29,574)	—	(29,574)
Other comprehensive loss	—	—	—	—	(32)	(32)
Stock-based compensation related to issuance of common stock and options in exchange for services	5,097	—	23	—	—	23
Issuance of common stock in connection with exercise of warrants	1,897,472	2	2,465	—	—	2,467
Issuance of common stock under equity plans	151,618	1	186	—	—	187
Stock-based compensation for equity-based awards to employees and directors	—	—	1,973	—	—	1,973
Balance at June 30, 2021	320,599,195	$ 321	$ 1,388,909	$ (1,213,027)	$ 3	$ 176,206

GERON CORPORATION
CONDENSED STATEMENTS OF STOCKHOLDERS' EQUITY
(IN THOUSANDS, EXCEPT SHARE DATA)
(UNAUDITED)

	Common Stock		Additional Paid-In	Accumulated	Accumulated Other Comprehensive	Total Stockholders'
	Shares	Amount	Capital	Deficit	Gain (Loss)	Equity
Balance at December 31, 2019	199,814,581	$ 200	$ 1,214,835	$ (1,080,012)	$ 132	$ 135,155
Net loss	—	—	—	(16,355)	—	(16,355)
Other comprehensive loss	—	—	—	—	(256)	(256)
Issuance of common stock in connection with at market offering, net of issuance costs of $76	530,228	—	686	—	—	686
Stock-based compensation related to issuance of common stock and options in exchange for services	6,039	—	16	—	—	16
Stock-based compensation for equity-based awards to employees and directors	—	—	1,568	—	—	1,568
Balance at March 31, 2020	200,350,848	200	1,217,105	(1,096,367)	(124)	120,814
Net loss	—	—	—	(15,824)	—	(15,824)
Other comprehensive income	—	—	—	—	313	313
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 $68	2,966,388	3	3,386	—	—	3,389
Issuance of common stock under equity plans	72,500	—	82	—	—	82
Stock-based compensation related to issuance of common stock and options in exchange for services	3,297	—	16	—	—	16
Stock-based compensation for equity-based awards to employees and directors	—	—	1,707	—	—	1,707
Balance at June 30, 2020	310,442,408	$ 310	$ 1,362,373	$ (1,112,191)	$ 189	$ 250,681

See accompanying notes.

GERON CORPORATION
CONDENSED STATEMENTS OF CASH FLOWS
(IN THOUSANDS)
(UNAUDITED)

	SIX MONTHS ENDED JUNE 30,	
	2021	2020
Cash flows from operating activities:		
Net loss	$ (57,398)	$ (32,179)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	101	60
Accretion and amortization on investments, net	778	(34)
Amortization of debt issuance costs/debt discount	374	—
Gain on sale of marketable securities	—	(19)
Gain on sales of equity investment	(1,233)	—
Change in fair value of equity investment, including foreign currency translation	—	(279)
Stock-based compensation for services by non-employees	48	32
Stock-based compensation for employees and directors	3,767	3,275
Amortization of right-of-use assets	266	580
Changes in assets and liabilities:		
Current and noncurrent assets	(3,042)	389
Amount due to Janssen Biotech, Inc.	—	(14,269)
Current and noncurrent liabilities	5,791	3,855
Net cash used in operating activities	(50,548)	(38,589)
Cash flows from investing activities:		
Purchases of property and equipment	(10)	(386)
Purchases of marketable securities	(82,430)	(182,355)
Proceeds from sales of marketable securities	—	7,681
Proceeds from maturities of marketable securities	149,834	78,012
Proceeds from sales of equity investment	1,594	—
Net cash provided by (used in) investing activities	68,988	(97,048)
Cash flows from financing activities:		
Proceeds from issuances of common stock from equity plans	204	82
Proceeds from issuance of common stock and warrants in public offering, net of paid issuance costs	—	140,794
Proceeds from issuances of common stock from at market offerings, net of paid issuance costs	16,234	4,075
Proceeds from exercise of warrants	2,479	—
Proceeds from debt financing	10,000	—
Net cash provided by financing activities	28,917	144,951
Net increase in cash, cash equivalents and restricted cash	47,357	9,314
Cash, cash equivalents and restricted cash at the beginning of the period	10,288	13,914
Cash, cash equivalents and restricted cash at the end of the period	$ 57,645	$ 23,228

See accompanying notes.

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Presentation

The terms “Geron”, the “Company”, “we” and “us” as used in this report refer to Geron Corporation. The accompanying unaudited condensed financial statements have been prepared in accordance with generally accepted accounting principles for interim financial information and with the instructions to Form 10-Q and Article 10 of Regulation S-X. Accordingly, they do not include all of the information and footnotes required by United States, or U.S., generally accepted accounting principles, or GAAP, for complete financial statements. In the opinion of management, all adjustments (consisting only of normal recurring accruals) considered necessary for a fair presentation have been included. Operating results for the three and six months ended June 30, 2021 are not necessarily indicative of the results that may be expected for the year ending December 31, 2021 or any other period. These financial statements and notes should be read in conjunction with the financial statements for each of the three years ended December 31, 2020, included in our Annual Report on Form 10-K for the year ended December 31, 2020, or the Form 10-K. The accompanying condensed balance sheet as of December 31, 2020 has been derived from audited financial statements at that date.

Prior Period Reclassification

The prior period presentation of interest and other income and other expense has been updated to conform to current period presentation.

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 May 2020, we entered into an underwriting agreement in connection with a public offering of our common stock, a pre-funded warrant to purchase 8,335,239 shares of our common stock, or the pre-funded warrant, together with accompanying warrants to purchase shares of our common stock. The pre-funded warrant is exercisable immediately at an exercise price of $0.001 per share. We included the pre-funded warrant in the computation of basic net loss per share, as applicable, since the exercise price is negligible, and the pre-funded warrant may be exercised at any time.

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 condensed statements of operations. Since we incurred a net loss for the three and six months ended June 30, 2021 and 2020, the diluted net loss per share calculation excludes potential dilutive securities of 106,492,740 and 101,548,346, respectively, related to outstanding stock options and warrants as their effect would have been anti-dilutive.

Use of Estimates

The accompanying condensed financial statements have been prepared in accordance with GAAP. The preparation of financial statements in conformity with 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. government sponsored enterprise securities, U.S. Treasury 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 condensed 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 three and six months ended June 30, 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 condensed 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 condensed 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 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 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 condensed 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

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 Accounting Standards Codification Topic 606, *Revenue from Contracts with Customers*, or 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 and/or Collaboration 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. In 2020, all license agreements related to our human telomerase reverse transcriptase, or hTERT, technology have been terminated or expired due to patent expirations on such technology. 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.

As of 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 our 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.

Cost Sharing Arrangements. Research and development and other expenses being shared by both parties under an agreement are recorded as earned or owed based on the performance obligations by both parties under the respective agreement. For arrangements in which we and our collaboration partner in the agreement are exposed to significant risks and rewards that depend on the commercial success of the activity, we recognize payments between the parties on a net basis and record such amounts as a reduction or addition to research and development expense. For arrangements in which we have agreed to perform certain research and development services for our collaboration partner and are not exposed to significant risks and rewards that depend on the commercial success of the activity, we recognize the respective cost reimbursements as revenue under the collaboration agreement over time in a manner proportionate to the costs we incurred to perform the services using the input method.

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 consist of expenses incurred in identifying, developing and testing product candidates resulting from our independent efforts as well as efforts associated with prior collaboration agreements. These expenses include, but are not limited to, in-process research and development acquired in an asset acquisition and deemed to have no alternative future use, payroll and personnel expense, lab supplies, non-clinical studies, clinical trials, including support for investigator-sponsored 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, our proportionate share of research and development costs under cost sharing arrangements with collaborative partners and research-related overhead. Research and development costs are expensed as incurred, including costs incurred under our collaboration and/or license agreements, if any.

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 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 following table summarizes the stock-based compensation expense included in operating expenses on our condensed statements of operations related to stock options and employee stock purchases for the three and six months ended June 30, 2021 and 2020, which was allocated as follows:

	Three Months Ended June 30,		Six Months Ended June 30,	
(In thousands)	2021	2020	2021	2020
Research and development	$ 906	$ 579	$ 1,731	$ 1,080
General and administrative	1,067	1,128	2,036	2,195
Stock-based compensation expense included in operating expenses	$ 1,973	$ 1,707	$ 3,767	$ 3,275

As stock-based compensation expense recognized in our condensed statements of operations for the three and six months ended June 30, 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. We have not recognized any stock-based compensation expense for performance-based stock options on our condensed statements of operations for the three and six months ended June 30, 2021 and 2020, as achievement of the specified strategic milestones was not considered probable at that time.

Stock Options

We grant service-based and performance-based options under our equity plans to employees, non-employee directors and consultants. The service-based vesting period for employee options is generally four years from the date of the option grant. Performance-based options vest upon the achievement of specified strategic milestones. The fair value of service-based options granted during the six months ended June 30, 2021 and 2020 has been estimated at the date of grant using the Black Scholes option-pricing model with the following assumptions:

	Six Months Ended June 30,	
	2021	2020
Dividend yield	0%	0%
Expected volatility range	0.778 to 0.783	0.781 to 0.790
Risk-free interest rate range	0.51% to 0.94%	0.37% to 1.62%
Expected term	5.5 yrs	5.25 yrs

Employee Stock Purchase Plan

The fair value of employees' purchase rights during the six months ended June 30, 2021 and 2020 has been estimated using the Black Scholes option-pricing model with the following assumptions:

	Six Months Ended June 30,	
	2021	2020
Dividend yield	0%	0%
Expected volatility range	0.507 to 0.680	0.478 to 0.564
Risk-free interest rate range	0.09% to 0.16%	1.56% to 1.57%
Expected term range	6 mos to 12 mos	6 mos to 12 mos

Dividend yield is based on historical cash dividend payments. The expected volatility 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 options is derived from actual historical exercise and post-vesting cancellation data and represents the period of time that options granted are expected to be outstanding. The expected term of employees' purchase rights is equal to the purchase period.

Non-Employee Stock-Based Awards

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 condensed statements of operations.

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 Pronouncement – Recently Adopted

In October 2020, the Financial Accounting Standards Board, or FASB, issued Accounting Standards Update No. 2020-08, *Codification Improvements to Subtopic 310-20, Receivables — Nonrefundable Fees and Other Costs*, or ASU 2020-08, which clarifies that "an entity should reevaluate whether a callable debt security is within the scope of paragraph 310-20-35-33 for each reporting period". We adopted ASU 2020-08 as of January 1, 2021. The adoption of this new guidance did not have a material impact on our condensed financial statements.

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 condensed 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 Board 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 condensed 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 condensed financial statements.

2. FAIR VALUE MEASUREMENTS

Cash Equivalents and Marketable Securities

Cash equivalents, restricted cash and marketable securities by security type at June 30, 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	$ 33,293	$ —	$ —	$ 33,293
Commercial paper	18,247	—	(1)	18,246
	$ 51,540	$ —	$ (1)	$ 51,539
Restricted cash:				
Money market fund	$ 92	$ —	$ —	$ 92
Certificate of deposit	271	—	—	271
	$ 363	$ —	$ —	$ 363
Marketable securities:				
U.S. Treasury securities (due in less than one year)	$ 10,604	$ 5	$ —	$ 10,609
U.S. Treasury securities (due in one to two years)	8,562	—	(1)	8,561
Government-sponsored enterprise securities (due in less than one year)	11,249	4	—	11,253
Government-sponsored enterprise securities (due in one to two years)	5,000	—	(5)	4,995
Commercial paper (due in less than one year)	64,430	15	(9)	64,436
Corporate notes (due in less than one year)	54,637	38	(14)	54,661
Corporate notes (due in one to two years)	26,994	—	(29)	26,965
	$ 181,476	$ 62	$ (58)	$ 181,480

Cash equivalents, restricted cash and marketable securities by security type at December 31, 2020 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	$ 4,356	$ —	$ —	$ 4,356
Restricted cash:				
Money market fund	$ 92	$ —	$ —	$ 92
Certificate of deposit	271	—	—	271
	$ 363	$ —	$ —	$ 363
Marketable securities:				
U.S. Treasury securities (due in less than one year)	$ 5,608	$ 2	$ —	$ 5,610
U.S. Treasury securities (due in one to two years)	5,093	2	—	5,095
Government-sponsored enterprise securities (due in less than one year)	5,249	3	—	5,252
Government-sponsored enterprise securities (due in one to two years)	23,499	7	(1)	23,505
Commercial paper (due in less than one year)	112,388	29	(8)	112,409
Corporate notes (due in less than one year)	63,051	35	(7)	63,079
Corporate notes (due in one to two years)	34,771	33	(17)	34,787
	$ 249,659	$ 111	$ (33)	$ 249,737

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 June 30, 2021 and December 31, 2020 were as follows:

	Less Than 12 Months		12 Months or Longer		Total	
(In thousands)	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses
As of June 30, 2021:						
U.S. Treasury securities securities (due in one to two years)	$ 5,999	$ (1)	$ —	$ —	$ 5,999	$ (1)
Government-sponsored enterprise securities (due in one to two years)	4,995	(5)	—	—	4,995	(5)
Commercial paper (due in less than one year)	35,718	(10)	—	—	35,718	(10)
Corporate notes (due in less than one year)	8,026	(14)	—	—	8,026	(14)
Corporate notes (due in one to two years)	22,964	(29)	—	—	22,964	(29)
	$ 77,702	$ (59)	$ —	$ —	$ 77,702	$ (59)
As of December 31, 2020:						
Government-sponsored enterprise securities (due in one to two years)	$ 4,999	$ (1)	$ —	$ —	$ 4,999	$ (1)
Commercial paper (due in less than one year)	22,956	(8)	—	—	22,956	(8)
Corporate notes (due in less than one year)	12,573	(7)	—	—	12,573	(7)
Corporate notes (due in one to two years)	16,322	(17)	—	—	16,322	(17)
	$ 56,850	$ (33)	$ —	$ —	$ 56,850	$ (33)

The gross unrealized losses related to U.S. Treasury securities, government-sponsored enterprise securities, commercial paper and corporate notes as of June 30, 2021 and December 31, 2020 were due to changes in interest rates and not credit risk. We determined that the gross unrealized losses on our marketable securities as of June 30, 2021 and December 31, 2020 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 current COVID-19 pandemic. 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 condensed 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 an 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 condensed balance sheets, including the category for such financial instruments.

Money market funds 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, government-sponsored enterprise securities, corporate notes and equity investments 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 June 30, 2021 and December 31, 2020 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 June 30, 2021:				
Money market funds(1)	$ 33,293	$ —	$ —	$ 33,293
U.S. Treasury securities(2)(3)	—	19,170	—	19,170
Government-sponsored enterprise securities(2)(3)	—	16,248	—	16,248
Commercial paper(1)(2)	—	82,682	—	82,682
Corporate notes(2)(3)	—	81,626	—	81,626
Total	$ 33,293	$ 199,726	$ —	$ 233,019
As of December 31, 2020:				
Money market funds(1)	$ 4,356	$ —	$ —	$ 4,356
U.S. Treasury securities(2)(3)	—	10,705	—	10,705
Government-sponsored enterprise securities(2)(3)	—	28,757	—	28,757
Commercial paper(2)	—	112,409	—	112,409
Corporate notes(2)(3)	—	97,866	—	97,866
Equity investment(4)	—	361	—	361
Total	$ 4,356	$ 250,098	$ —	$ 254,454

(1) Included in cash and cash equivalents on our condensed balance sheets.

(2) Included in current portion of marketable securities on our condensed balance sheets.

(3) Included in noncurrent portion of marketable securities on our condensed balance sheets.

(4) Included in deposits and other assets on our condensed balance sheets. See “Equity Investment” in this Note 2 for further discussion of this equity investment.

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 Sienna 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. With the adoption of ASU No. 2016-01, *Financial Instruments - Overall: Recognition and Measurement of Financial Assets and Financial Liabilities*, beginning 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 condensed 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. Effective December 1, 2020, BARD1 completed a 1 for 30 reverse stock split. Consequently, as of December 31, 2020, we held 688,929 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 condensed statements of operations. As of March 31, 2021, no value remained for our equity investment in BARD1.

3. CONTINGENCIES AND UNCERTAINTIES

Purported Securities Lawsuits

Between January 23, 2020 and March 5, 2020, three putative 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 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, our Phase 2 clinical trial 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 relapsed/refractory myelofibrosis, 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 complaint was filed on May 13, 2021. Discovery has commenced, although the Court has not yet entered a case schedule or set a trial date.

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 board members. 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. The court has not set a hearing date for the motion;
- 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 in the Chancery Court Derivative Lawsuits;
- The consolidated shareholder derivative actions filed in the Northern District have been stayed pending the Northern District's ruling on a motion by lead plaintiffs in the consolidated class action lawsuit to certify the putative class in the case; 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.

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 may incur substantial legal fees and costs in connection with such lawsuits. We currently are not able to estimate the possible cost to us from these matters, as the pending lawsuits are currently at an early stage, and we cannot be certain how long it may take to resolve the pending lawsuits or the possible amount of any damages that we may be required to pay. Such amounts could be material to our 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. It is possible that we could, in the future, incur judgments or enter into settlements of claims for monetary damages.

Risks Related to COVID-19

As of the date of this filing, uncertainty continues to exist concerning the ultimate duration and severity of the COVID-19 pandemic. At this time, the number of COVID-19 cases are increasing in certain regions due to the spread of COVID-19 variants, leading to the re-implementation of mask restrictions, social distancing and other restrictions. In addition, the variable and gradual process of vaccine distribution in some countries and the concern over further waves of infections are causing continued unpredictability and uncertainty about the pace at which clinical trial operations may normalize to allow patients and healthcare workers to return to clinical sites.

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 persist for an extended period of time and/or become more severe, we could experience significant disruptions to our clinical development timelines, continued delays in patient enrollment in our ongoing Phase 3 clinical trials, 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. We have allowed limited 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. We plan to continue to evaluate our business operations based on new information as it becomes available regarding the pandemic and will make changes that we consider necessary in light of any new developments.

The effects of the COVID-19 pandemic 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 conduct and complete current Phase 3 clinical trials of imetelstat and to commence, conduct and complete any other potential future clinical trials of imetelstat. In addition, the global economic slowdown caused by the COVID-19 pandemic could materially and adversely affect our business and the value of our common stock.

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 as the ultimate duration and severity of the pandemic, travel restrictions, quarantines, social distancing and business closure requirements in the United States and in other countries, and the effectiveness of 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 the future of imetelstat.

4. 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 Loan Agreement, up to $75,000,000, which can be drawn in three tranches. 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 $25,000,000 to $30,000,000, and the minimum cash covenant required upon the execution of certain licensing transactions being executed was increased from $30,000,000 to $35,000,000. All other terms of the Loan Agreement were unchanged, including the maturity date, interest rate, payment terms, events of default and other covenants. We are in compliance with the covenants under the Loan Agreement as of June 30, 2021.

Under the amended terms of the Loan Agreement, the Term Loan can be drawn as follows: (i) Tranche A loan of up to $35,000,000 of which $25,000,000 was funded on the Closing Date and the remaining $10,000,000 was drawn on June 15, 2021, (ii) Tranche B loan of up to $15,000,000 which is available to be drawn from January 1, 2021 to December 15, 2021, subject to the achievement of certain clinical milestones, and (iii) Tranche C loan of up to $25,000,000 available to be drawn through December 31, 2022, subject to approval by an investment committee comprised of Hercules and SVB.

As of June 30, 2021, the net carrying value of the loan amounts under Tranche A was $34,416,000, which includes the principal amount of $35,000,000 for Tranche A, less net unamortized discounts and debt issuance costs of $917,000 plus accrued end of term charge of $333,000. The carrying value of the debt approximates the fair value as of June 30, 2021. Debt discounts and debt issuance costs are being amortized to interest expense over the life of loan amounts under Tranche A using the effective interest rate method.

The following table presents future minimum payments, including interest and the end of term charge, under the Loan Agreement, as amended, as of June 30, 2021 (in thousands):

Remainder of 2021	$ 1,566
2022	5,858
2023	19,187
2024	18,338
Total	44,949
Less: amount representing interest	(7,657)
Less: unamortized debt discount and issuance costs	(917)
Less: unamortized end of term charge	(1,959)
Less: current portion of debt	—
Noncurrent portion of debt	$ 34,416

5. OPERATING LEASES

Parsippany, 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. As of the lease commencement date, the right-of-use asset and corresponding operating lease liability was approximately $2,356,000, which represented the present value of remaining lease payments over the initial lease term of 11 years, net of a seven-month rent abatement period and, using an incremental borrowing rate of 8%. 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 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.

Foster City, California 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.

The future non-cancellable lease payments under the New Jersey Lease and the Foster City Lease as of June 30, 2021 were as follows (in thousands):

Remainder of 2021	$ 459
2022	937
2023	962
2024	988
2025	1,014
Thereafter	2,807
Total lease payments	7,167
Less: imputed interest	(1,738)
Total	$ 5,429

6. STOCKHOLDERS' EQUITY

At Market Issuance Sales Agreement

On September 4, 2020, we entered the At Market Issuance Sales Agreement with B. Riley Securities, Inc., or 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 $100,000,000 in such quantities and on such minimum price terms as we set from time to time through B. Riley Securities, Inc., or B. Riley Securities, as our sales agent. We pay B. Riley Securities 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 Securities under the 2020 Sales Agreement. For the three months ended March 31, 2021, we sold an aggregate of 7,948,505 shares of our common stock pursuant to the 2020 Sales Agreement, resulting in net cash proceeds to us of approximately $16,234,000, after deducting sales commissions and other offering expenses payable by us. No sales were made during the three months ended June 30, 2021. Approximately $83,000,000 of our common stock remained available for issuance under the 2020 Sales Agreement as of June 30, 2021. 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.

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.

2018 Equity Incentive Plan

In May 2021, our stockholders approved an amendment to our 2018 Equity Incentive Plan to increase the total number of shares issuable under such plan by 12,500,000 shares of common stock.

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 common stock (subject to customary adjustments in the event of a change in capital structure) to be used exclusively for grants of inducement awards to individuals who were not previously Geron employees or directors, other than following a bona fide period of non-employment. In January 2019, February 2020, February 2021 and May 2021, our Compensation Committee approved amendments to increase the reserve of shares of our common stock under the Inducement Plan by 5,000,000, 1,300,000, 800,000 and 5,000,000 shares, respectively. As a result, an aggregate total of 15,100,000 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 Equity Incentive Plan.

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

FORWARD-LOOKING STATEMENTS

This Form 10-Q contains forward-looking statements that involve risks and uncertainties, as well as assumptions that, if they never materialize or prove incorrect, could cause our results 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. These statements are within the meaning of the "safe harbor" provisions of the Private Securities Litigation Reform Act of 1995. These statements appear throughout the Form 10-Q and are statements regarding our intent, belief, or current expectations, primarily with respect to our business and related industry developments. You should not place undue reliance on these forward-looking statements, which apply only as of the date of this Form 10-Q. Our actual results could differ materially from those anticipated in these forward-looking statements for many reasons, including the risks faced by us and described in Part II, Item 1A, entitled "Risk Factors," and in "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Part I, Item 2 of this Form 10-Q.

OVERVIEW

The following discussion should be read in conjunction with the unaudited condensed financial statements and notes thereto included in Part I, Item 1 of this Form 10-Q; and the sections entitled "Business" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" contained in our Form 10-K, as filed with the United States Securities and Exchange Commission, or SEC, on March 11, 2021.

Business Overview

Geron is a late-stage clinical biopharmaceutical company that is focused on the development and potential commercialization of imetelstat, an innovative therapeutic for hematologic myeloid malignancies. Geron's vision is to be recognized as a leader in the treatment of blood cancers, or hematologic malignancies. Geron is committed to improving and extending the lives of patients by changing the course of these diseases by targeting telomerase. We are currently focused on the development and potential commercialization of imetelstat, a first in class telomerase inhibitor, and are conducting two ongoing Phase 3 clinical trials that are intended to enable registration: (i) IMerge Phase 3 in Low or Intermediate-1 risk myelodysplastic syndromes, or lower risk MDS, and (ii) IMpactMF in Intermediate-2 or High-risk myelofibrosis, or refractory MF.

As discussed below, we have experienced, and continue to experience, delays in our clinical trial activities due to the COVID-19 pandemic. As a result, the pace of enrollment in IMerge Phase 3 has been slower than originally planned. As of August 12, 2021, we attained 91% of the planned patient enrollment. We currently expect IMerge Phase 3 to be fully enrolled in the fourth quarter of 2021.

In our trial design for the IMerge Phase 3 primary analysis, we planned to use data as of a clinical cut-off date occurring 15 months after the last patient had been enrolled, to allow sufficient time to treat and follow-up with patients in order to obtain a mature data set for the assessment of safety and efficacy of imetelstat, including durability of transfusion independence. The significantly longer patient enrollment period caused by the COVID-19 pandemic has enabled a longer follow-up period than previously projected. As a result, we determined that the clinical cut-off date for the primary analysis could occur three months earlier than originally planned (i.e., 12 months instead of 15 months after the last patient has been enrolled), because we expect the data as of the earlier clinical cut-off date will be sufficiently mature to assess the safety and efficacy of imetelstat, including durability of transfusion independence. With this change, the primary analysis will exclude clinical responses which could occur after the earlier clinical cut-off date; however, we believe few, if any, clinical responses will be excluded in this manner, since 91% of patients have already been enrolled into the trial. Accordingly, we shortened the follow-up period after the last patient has been enrolled from 15 months to 12 months to enable the earlier clinical cut-off date.

Based on current planning assumptions, including the revised 12-month follow-up period after the last patient has been enrolled, we project that top-line results from IMerge Phase 3 will be available in the first quarter of 2023. Assuming the results of IMerge Phase 3 support regulatory submissions, we plan to submit in 2023 a New Drug Application, or NDA, in the United States, and a marketing authorization application, or MAA, in Europe, for imetelstat in lower risk MDS. Under either a priority or standard review for the NDA and, upon potential approval by the United States Food and Drug Administration, or the FDA, we expect that commercial launch of imetelstat in lower risk MDS in the United States could occur in the first half of 2024. In Europe, we anticipate review of the MAA by the European Medicines Agency, or EMA, could take approximately 12 months and that commercial launch of imetelstat in lower risk MDS in Europe could occur in the second half of 2024.

If imetelstat is approved for marketing by regulatory authorities, we plan to commercialize imetelstat independently in the United States and may seek potential commercialization partners for territories outside of the United States.

As of June 30, 2021, we had approximately $239.1 million in cash, cash equivalents, restricted cash and current and noncurrent marketable securities. This balance includes a draw down of $10.0 million that we made in June 2021 from the remaining portion of the first tranche under the Loan Agreement. Under current planning assumptions, we believe that our existing capital resources, together with future interest income and the $15.0 million second tranche draw down available to us under the Loan Agreement assuming certain clinical milestones are met, will be sufficient to fund our current level of operations until the end of the first quarter of 2023. If top-line results from IMerge Phase 3 are not available until after the end of the first quarter of 2023 or we are unable or unwilling to draw down the second tranche of the Loan Agreement, whether due to our inability to meet the required clinical milestones in order to draw down the second tranche or otherwise, we will require additional capital to reach top-line results in IMerge Phase 3. In any event, we will require substantial additional funding to further advance the imetelstat program, including through IMerge Phase 3 and IMpactMF and conducting the clinical, regulatory and potential commercialization activities necessary to bring imetelstat to market in lower risk MDS and refractory MF.

Impact of COVID-19 on Our Business

As of the date of this filing, uncertainty continues to exist concerning the ultimate duration and severity of the COVID-19 pandemic. At this time, COVID-19 cases are increasing due to the spread of COVID-19 variants, leading to the re-implementation of mask restrictions, social distancing and other restrictions. In addition, the variable and gradual process of vaccine distribution in some countries and the concern over further waves of infections are causing continued unpredictability and uncertainty about the pace at which clinical trial operations may normalize to allow patients and healthcare workers to return to clinical sites.

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 and IMpactMF, due to the COVID-19 pandemic. Taking into account the dynamic and evolving circumstances of the COVID-19 pandemic on our clinical trial activities, under current planning assumptions, we expect IMerge Phase 3 to be fully enrolled in the fourth quarter of 2021. We have 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 data to be used for the primary analysis of safety and efficacy of imetelstat, including durability of transfusion independence. Based on current planning assumptions, including the revised 12-month follow-up period after the last patient has been enrolled, we project that top-line results from IMerge Phase 3 will be available in the first quarter of 2023. If top-line results from IMerge Phase 3 are not available until after the end of the first quarter of 2023 or we are unable or unwilling to draw down the second tranche of the Loan Agreement, whether due to our inability to meet the required clinical milestones in order to draw down the second tranche or otherwise, we will require additional capital to reach top-line results in IMerge Phase 3.

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 myelofibrosis, or MF and other oncology indications. To address these challenges, we have expanded the number of countries and sites where we plan to conduct IMpactMF. We continue to monitor each clinical site through our CROs as well as to conduct direct outreach to investigators and study staff. In addition, we plan to implement the same enrollment-boosting activities for IMpactMF that we employed for IMerge Phase 3, including engaging clinical science liaisons and utilizing social media. Given the challenges caused by the COVID-19 pandemic, under current planning assumptions, we expect the interim analysis for IMpactMF may occur in 2024 and the final analysis in 2025. Because these analyses are event-driven, the results may be available at different times than currently expected.

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. We have allowed limited 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. We plan to continue to evaluate our business operations based on new information as it becomes available regarding the pandemic and will make changes that we consider necessary in light of any new developments.

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 clinical trials, our operations and our business, all of which are highly reliant on the continued worldwide progress toward managing this health crisis. All plans and timing expectations will be delayed or interrupted if COVID-19 pandemic conditions worsen, creating further limitations on our clinical trial activities.

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

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 in transfusion dependent lower risk MDS patients who are relapsed after or refractory to prior treatment with an erythropoietin stimulating agent, or ESA. To be eligible for IMerge, patients are 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. Part 1 of IMerge was designed as a Phase 2, open label, single-arm trial to assess the efficacy and safety of a 7.5 mg/kg dose of imetelstat administered as an intravenous infusion every four weeks.

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, we expect will support, if successful, the registration of imetelstat in lower risk MDS. The trial is designed to enroll approximately 170 patients with lower risk transfusion dependent MDS who are relapsed or refractory to an ESA, have not received prior treatment with either a hypomethylating agent, or HMA, or lenalidomide and are non-del(5q). IMerge Phase 3 is being conducted at over 100 medical centers globally, including North America, Europe, Middle East and Asia. Further information on IMerge Phase 3, including the trial design, patient eligibility criteria and locations of clinical sites, is posted on clinicaltrials.gov.

The primary efficacy endpoint of IMerge 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 transfusion during any consecutive eight weeks since entry to the trial, or 8-week RBC-TI rate. Key secondary endpoints include the rate of RBC-TI lasting at least 24 weeks, or 24-week RBC-TI rate, 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 efficacy 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 overall survival, or OS, and time to progression to acute myeloid leukemia.

Current Status of IMerge Phase 3

IMerge Phase 3 opened for patient screening and enrollment in August 2019, and the first patient was dosed in October 2019. As of August 12, 2021, we attained 91% of the planned patient enrollment. Taking into account the dynamic and evolving circumstances of the COVID-19 pandemic on our clinical trial activities, under current planning assumptions, we expect IMerge Phase 3 to be fully enrolled in the fourth quarter of 2021.

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 data to be used for the primary analysis of safety and efficacy of imetelstat, including durability of transfusion independence. Based on current planning assumptions, including the revised 12-month follow-up period after the last patient has been enrolled, we project top-line results from IMerge Phase 3 will be available in the first quarter of 2023. The timing and achievement of enrollment completion and top-line results depend on numerous factors, including further delays or interruptions of enrollment related to the effects of the COVID-19 pandemic. In addition, our ability to conduct and complete IMerge Phase 3 depends on whether we can maintain the relevant clearances from regulatory authorities and other institutions to conduct and complete the trial, and our ability to raise additional capital to reach top-line results in the trial if such results are not available until after the end of the first quarter of 2023 or if we are unable or unwilling to draw down the second tranche of the Loan Agreement.

Second Indication in Phase 3 Development: Intermediate-2 or High-Risk Myelofibrosis

IMpactMF: Ongoing Phase 3 Clinical Trial in Refractory MF

IMpactMF, our Phase 3 clinical trial in refractory MF, is an open label, 2:1 randomized, controlled clinical trial to evaluate imetelstat (9.4 mg/kg administered by intravenous infusion over two hours every three weeks) in approximately 320 patients with refractory MF. Patients refractory to a janus kinase, or JAK, inhibitor, or JAKi, are defined as having an inadequate spleen response or symptom response after treatment with a JAKi for at least six months, including an optimal dose of a JAKi for at least two months. The best available therapy, or BAT, control arm of IMpactMF excludes use of JAKi. 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. 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.

The primary efficacy endpoint for IMpactMF is OS. Key secondary endpoints include symptom response, spleen response, progression free survival, complete response, partial response, clinical improvement, duration of response, safety, pharmacokinetics, and patient reported outcomes. Currently, we expect to engage over 180 sites to participate in IMpactMF across North America, South America, Europe, Australia and Asia. Further information on IMpactMF, including the trial design, patient eligibility criteria and locations of clinical sites, is posted on clinicaltrials.gov.

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 (each death referred to herein as an "event"). An interim analysis of OS is planned to be conducted after approximately 70% of the total projected number of events for the final analysis have occurred.

Current Status of IMpactMF

IMpactMF opened for patient screening and enrollment in December 2020. As of August 12, 2021, we have 55 sites open for patient enrollment. 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. In addition, we expect the interim analysis for IMpactMF may occur in 2024 and the final analysis in 2025. Because these analyses are event-driven, 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 support the registration of imetelstat in 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. In addition, our ability to conduct and complete IMpactMF depends on whether we can obtain and maintain the relevant clearances from regulatory authorities and other institutions to conduct and complete the trial, and our ability to raise additional capital in order to complete the trial.

We Believe Recently Reported Clinical Data Support Phase 3 Development of Imetelstat's Telomerase Inhibition Approach

Poster Presentations at EHA2021 Virtual Congress

In June 2021, two poster presentations of imetelstat Phase 2 data were made at the European Hematology Association, or EHA, Virtual Congress. We believe that the data reported in these poster presentations, which are publicly available, further support imetelstat's potentially differentiated approach to inhibiting telomerase activity to target the malignant stem and progenitor cells in the bone marrow responsible for the underlying hematologic myeloid malignancies.

The first poster presented new data and analyses of the clinical efficacy of imetelstat in molecularly defined subtypes based on cytogenetic and mutation profiles for patients in IMerge Phase 2, our Phase 2 clinical trial of imetelstat in lower risk MDS patients who are relapsed after or refractory to treatment with an ESA and are non-del(5q). As reported at previous EHA meetings, meaningful and durable transfusion independence was observed in patients from IMerge Phase 2, including transfusion-free periods greater than one year, as well as substantial increases in hemoglobin. The presentation reported clinical responses across different cytogenetic and molecularly defined categories, and these responses were independent of mutation status or number of mutations. These data support the unique telomerase inhibition mechanism of action of imetelstat and the potential to target the malignant stem and progenitor cells of the underlying disease. We are exploring these observations further in the ongoing IMerge Phase 3.

The second poster at EHA presented new analyses of safety data from the IMbark Phase 2 trial in MF and the IMerge Phase 2 trial in lower risk MDS to understand the characteristics of hematologic and non-hematologic adverse events. These analyses highlighted that the imetelstat-related cytopenias, or low blood cell counts, are short, reversable and with limited clinical consequence when managed with the dose modification guidelines in the protocols. These data provide further evidence for the on-target effect of imetelstat based on the selective reduction of malignant cells in the bone marrow through telomerase inhibition.

Publication of IMbark Phase 2 Data in Journal of Clinical Oncology

Efficacy, safety and biomarker results from the IMbark Phase 2 clinical trial were published in the Journal of Clinical Oncology in a paper entitled "Randomized, Single-Blind, Multicenter Phase II Study of Two Doses of Imetelstat in Relapsed or Refractory

Myelofibrosis." The publication, which is publicly-available, highlights the clinical benefits observed in the study, including symptom response and OS, as well as evidence of disease-modifying activity from biomarker and bone marrow fibrosis assessments. The IMpactMF trial was designed to confirm the Phase 2 results. Currently, there is no drug therapy approved by the FDA for patients who fail or no longer respond to JAKi therapies, and median survival for such refractory MF patients after discontinuation from ruxolitinib is only approximately 14 to 16 months, representing a significant unmet medical need.

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 June 30, 2021, we had approximately $239.1 million in cash, cash equivalents, restricted cash and current and noncurrent marketable securities and a long-term debt principal balance of $35.0 million.

In June 2021, we drew down the remaining $10.0 million available under Tranche A of the Loan Agreement with Hercules and SVB. This loan amount bears the same interest rate of 9.0% as the initial draw down under Tranche A. 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. See Note 4 on Debt 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 June 30, 2021, we had an accumulated deficit of approximately $1.2 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 will require significant additional clinical testing prior to possible regulatory approval in the United States 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 through late-stage development, including the conduct and completion of IMerge Phase 3 and IMpactMF. To further advance the imetelstat program, including conducting the clinical and regulatory activities necessary to obtain regulatory approval for imetelstat and establishing sales and marketing capabilities to commercialize imetelstat in the United States on our own, if regulatory approval is granted, substantial additional capital will be required. If approved for marketing by regulatory authorities outside of the United States, we may seek potential commercialization partners for such territories. We do not expect imetelstat to be commercially available for many years, if at all.

CRITICAL ACCOUNTING POLICIES AND ESTIMATES

There have been no significant changes in our critical accounting policies and estimates during the six months ended June 30, 2021, as compared to the critical accounting policies and estimates disclosed in Form 10-K.

Our condensed financial statements have been prepared in accordance with U.S. generally accepted accounting principles for interim financial information. The preparation of these financial statements requires management to make estimates and assumptions that affect the reported 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. Note 1 of Notes to Condensed Financial Statements of this Form 10-Q describes the significant accounting policies used in the preparation of the condensed financial statements.

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 condensed 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 condensed financial statements are fairly stated in accordance with accounting principles generally accepted in the United States, and present a meaningful presentation of our financial condition and results of operations.

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.

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; overcoming disruptions and/or delays due to the COVID-19 pandemic; 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. We do not expect to receive revenue based on sales of imetelstat for many years, if at all.

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 human telomerase reverse transcriptase, or 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 recognized license fee revenues of $28,000 in each of the periods for the three and six months ended June 30, 2021, compared to $5,000 for each of the comparable periods in 2020 related to our various license agreements. The decrease in license fee revenues for the three and six months ended June 30, 2021, compared to the same periods in 2020 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 $79,000 and $216,000 for the three and six months ended June 30, 2021, respectively, compared to $38,000 and $90,000, for the same periods in 2020. Royalty revenues in 2021 and 2020 primarily reflect estimated royalties from sales of cell-based research products from our divested stem cell assets.

Future license fee and royalty revenues are dependent on additional agreements being signed, if any, and the underlying patent rights remaining active. Historical revenues may not be predictive of future revenues. We expect revenues in 2021 to be lower than 2020 due to the termination and expiration of our license agreements related to our hTERT technology as a result of patent expirations on such technology. In addition, due to uncertainties caused by the COVID-19 pandemic, sales of cell-based research products from our divested stem cell programs may be lower which will reduce the royalties payable to us.

Research and Development Expenses

During the three and six months ended June 30, 2021 and 2020, imetelstat was the sole research and development program we supported. For the imetelstat research and development program, we incur direct external, personnel-related and other research and development costs. For the three and six months ended June 30, 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 Geron 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 three and six months ended June 30, 2021 and 2020 were as follows:

(In thousands)	Three Months Ended June 30, 2021	Three Months Ended June 30, 2020	Six Months Ended June 30, 2021	Six Months Ended June 30, 2020
			(Unaudited)	
Direct external expenses	$ 15,727	$ 6,858	$ 30,869	$ 13,490
Personnel-related expenses	5,176	3,351	10,268	6,716
All other expenses	1,034	636	1,913	1,441
Total research and development expenses	$ 21,937	$ 10,845	$ 43,050	$ 21,647

The increase in research and development expenses for the three and six months ended June 30, 2021, compared to the same periods in 2020, 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 commercial purposes. In addition, personnel-related expenses have increased in the three and six months ended June 30, 2021 compared to the same periods in 2020 as a result of additional development and manufacturing headcount being hired. We expect research and development expenses to increase in the future as we support the current two Phase 3 clinical trials of imetelstat, IMerge and IMpactMF. 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” in Part II, Item 1A entitled “Risk Factors” and elsewhere in this Form 10-Q.

General and Administrative Expenses

General and administrative expenses were $7.1 million and $14.5 million for the three and six months ended June 30, 2021, respectively, compared to $6.0 million and $12.1 million for the same periods in 2020. The increase in general and administrative expenses for the three and six months ended June 30, 2021, compared to the same periods in 2020, primarily reflects new costs in connection with pre-commercial activities, including modernizing the internal infrastructure to support a commercial launch, and higher legal costs. We expect general and administrative expenses to increase in the future as the imetelstat program matures and potential commercialization preparatory activities begin.

Interest Income

Interest income was $136,000 and $309,000 for the three and six months ended June 30, 2021, respectively, compared to $475,000 and $1.2 million for the same periods in 2020. The decrease in interest income for the three and six months ended June 30, 2021 compared to the same periods in 2020 reflects lower yields on our marketable securities portfolio due to declining 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 $804,000 and $1.5 million for the three and six months ended June 30, 2021, respectively, and 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. Since the Loan Agreement was executed in September 2020, no comparable interest expense amounts were recognized for the three and six months ended June 30, 2020.

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 condensed 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 three and six months ended June 30, 2020, there was an increase in fair value of $422,000 and $227,000, respectively, resulting from observable price changes in our equity investment.

Other Income and (Expense), Net

Net other expense was $17,000 and net other income was $1.2 million for the three and six months ended June 30, 2021, respectively, compared to net other income of $41,000 and net other expense of $3,000 for the same periods in 2020. 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. See Note 2 on Fair Value Measurements – Equity Investment for additional information about the sale of our equity investment. Also included in other income and expense are bank charges related to our cash operating accounts and marketable securities portfolio.

LIQUIDITY AND CAPITAL RESOURCES

As of June 30, 2021, we had cash, restricted cash, cash equivalents, and current and noncurrent marketable securities of $239.1 million, compared to $260.0 million at December 31, 2020. The net decrease in cash, restricted cash, cash equivalents, and current and noncurrent marketable securities during the six months ended June 30, 2021 was the net result of cash being used for operations, partially offset by the receipt of net cash proceeds of approximately $16.2 million from sales of our common stock under the 2020 Sales Agreement, as described below, and proceeds from an additional draw down of debt. In June 2021, we drew down the remaining $10.0 million available under Tranche A of the Loan Agreement. See Note 4 on Debt for additional information on the Loan Agreement.

We have an investment policy to invest our cash in liquid, investment grade securities, such as interest-bearing money market funds, certificates of deposit, municipal securities, U.S. government and agency securities, U.S. Treasury 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 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 $100.0 million in such quantities and on such minimum price terms as we set from time to time through B. Riley Securities as our sales agent. We pay B. Riley Securities 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 Securities under the 2020 Sales Agreement. For the three months ended March 31, 2021, we sold an aggregate of 7,948,505 shares of our common stock pursuant to the 2020 Sales Agreement, resulting in net cash proceeds to us of approximately $16.2 million, after deducting sales commissions and other offering expenses payable by us. No sales were made during the three months ended June 30, 2021. Approximately $83.0 million of our common stock remained available for issuance under the 2020 Sales Agreement as of June 30, 2021. 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.

On September 30, 2020, we, Hercules and SVB entered into the Loan Agreement for a term loan facility of up to $75.0 million which can be drawn in three tranches. 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.

Under current planning assumptions, we believe that our existing capital resources, together with future interest income and the $15.0 million second tranche draw down available to us under the Loan Agreement assuming certain clinical milestones are met, will be sufficient to fund our current level of operations until the end of the first quarter of 2023. Taking into account the dynamic and evolving circumstances of the COVID-19 pandemic on our clinical trial activities, under current planning assumptions, we expect IMerge Phase 3 to be fully enrolled in the fourth quarter of 2021. Based on current planning assumptions, including the revised 12-month follow-up period after last patient has been enrolled, we project top-line results from IMerge Phase 3 to be available in the first quarter of 2023. If top-line results from IMerge Phase 3 are not available until after the end of the first quarter of 2023 or we are unable or unwilling to draw down the second tranche of the Loan Agreement, whether due to our inability to meet the required clinical milestones in order to draw down the second tranche or otherwise, we will require additional capital to reach top-line results in IMerge Phase 3. In any event, we will require substantial additional funding to further advance the imetelstat program, including through IMerge Phase 3 and IMpactMF and conducting the clinical, regulatory and potential commercialization activities necessary to bring imetelstat to market in lower risk MDS and refractory MF. In addition, our ability to commercialize imetelstat in the United States, if regulatory approval is granted, depends on us being able to establish sales and marketing capabilities.

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, 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 will be further delayed or interrupted if COVID-19 pandemic conditions continue unabated, or worsen, creating further limitations on our clinical trial activities. 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 regulatory authorities in other countries;
- the scope, progress, duration, results and costs of current clinical trials, including IMerge Phase 3 and IMpactMF, and 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 IMerge Phase 3 or IMpactMF or any potential future clinical trials of imetelstat, whether as a result of the effects of the COVID-19 pandemic or for any other reasons;
- the costs, timing and outcomes of regulatory reviews or other regulatory actions related to imetelstat, such as obtaining and maintaining regulatory clearances and approvals for IMerge Phase 3 and IMpactMF in the United States 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 CMOs, 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 United States and other countries, and the associated costs;
- the costs and timing necessary to build a sales force in the United States to market and sell imetelstat, should it receive regulatory approval;
- the sales price for imetelstat;
- the availability of coverage and adequate third-party reimbursement for imetelstat;
- expenses associated with the pending putative securities class action lawsuits and 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;
- the costs of maintaining and operating facilities in California and New Jersey, telecommunications and administrative oversight, as well as higher expenses for travel when travel becomes possible in light of the COVID-19 pandemic; and
- the costs of enabling our personnel to work remotely, including providing supplies, equipment and technology necessary for them to perform their responsibilities.

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 with any further delays in reporting results from IMerge Phase 3 or IMpactMF. For example, if top-line results from IMerge Phase 3 are not available until after the end of the first quarter of 2023 or we are unable or unwilling to draw down the second tranche of the Loan Agreement, whether due to our inability to meet the required clinical milestones in order to draw down the second tranche or otherwise, we will require additional capital to reach top-line results in IMerge Phase 3, which may not be possible for us to obtain on acceptable terms, or at all.

Additional financing through public or private debt or equity financings, including pursuant to the 2020 Sales Agreement with B. Riley Securities, the Loan Agreement to the extent available, 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 caused by the effects of the COVID-19 pandemic, 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. If we are unable to raise additional capital or establish alternative collaborative arrangements with third-party collaborative partners for imetelstat, the development 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 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, future interest income, and potential future sales of our common stock, including under the 2020 Sales Agreement with B. Riley Securities or potential future draw downs, if available, under our Loan Agreement, will be sufficient to fund our operating plans. In any event, we will continue to need substantial additional funds to meet operational needs and capital requirements to advance the imetelstat program in clinical development, including through IMerge Phase 3 and IMpactMF and potential commercialization of imetelstat in lower risk MDS and refractory MF, and our need for additional funds may arise sooner than planned. If adequate funds are not available on a timely basis, if at all, we may be unable to pursue further development, including completing IMerge Phase 3 and IMpactMF, or commencing, conducting or completing other potential future clinical trials of imetelstat, or pursuing potential commercialization of imetelstat, which would severely harm our business and we might cease operations.

Cash Flows from Operating Activities. Net cash used in operations for the six months ended June 30, 2021 and 2020 was $50.5 million and $38.6 million, respectively. The increase in net cash used in operations for the six months ended June 30, 2021, compared to the same period in 2020, primarily reflects higher payments for research and development expenses in connection with supporting the current Phase 3 clinical trials, IMerge and IMpactMF, manufacturing validation batches of imetelstat and increases in development and manufacturing headcount.

Cash Flows from Investing Activities. Net cash provided by investing activities for the six months ended June 30, 2021 was $69.0 million and net cash used in investing activities for the six months ended June 30, 2020 was $97.0 million. The increase in net cash provided by investing activities in 2021 compared to 2020 primarily reflects a higher rate of maturities than purchases of marketable securities in 2021.

Cash Flows from Financing Activities. Net cash provided by financing activities for the six months ended June 30, 2021 and 2020 was $28.9 million and $145.0 million, respectively. Financing activities in 2021 primarily reflect the receipt of net cash proceeds from the sales of our common stock under the 2020 Sales Agreement and the $10.0 million draw down under Tranche A of the Loan Agreement. Financing activities in 2020 primarily reflect the receipt of $140.2 million in net proceeds from the underwritten public offering of common stock, pre-funded warrant and stock purchase warrants in May 2020, and the receipt of net cash proceeds from sales of our common stock under the At Market Issuance Sales Agreement with B. Riley FBR, Inc. executed in May 2018. See Note 4 on Debt for additional information on the Loan Agreement. See Note 6 on Stockholders' Equity for additional information about the 2020 Sales Agreement.

Contractual Obligations

In June 2021, we drew down the remaining $10.0 million available under Tranche A of the Loan Agreement, which has increased our noncurrent debt obligations. Other than this event, our future minimum contractual obligations at December 31, 2020 were reported in our Form 10-K filed with the SEC.

Off-Balance Sheet Arrangements

We have not engaged in any off-balance sheet arrangements, including the use of structured finance, special purpose entities or variable interest entities.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We are a smaller reporting company as defined by Rule 12b-2 of the Exchange Act, and are not required to provide the information specified under this item.

ITEM 4. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and our Chief Financial Officer, evaluated our disclosure controls and procedures as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, prior to the filing of this quarterly report. Based on that evaluation, our Chief Executive Officer and our Chief Financial Officer have concluded that, as of the end of the period covered by this quarterly report, our disclosure controls and procedures were effective at the reasonable assurance level.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting during the quarter to which this report relates that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Limitations on Effectiveness of Controls and Procedures

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 quarterly report, that our disclosure controls and procedures were effective to provide reasonable assurance that the objectives of our disclosure control system were met.

PART II. OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS

See Note 3 on Contingencies and Uncertainties for information on legal proceedings.

ITEM 1A. RISK FACTORS

Our business is subject to various 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 Quarterly Report on Form 10-Q and in our 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. We have marked with an asterisk (*) those risks described below that reflect substantive changes from, or additions to, the risks described under Part I, Item 1A, "Risk Factors" included in the Form 10-K.

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, are described below, and this summary is qualified in its entirety by that description. 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 below as part of your evaluation of an investment in our common stock.

Risks Related to the Development of Imetelstat

- We are wholly dependent on the success of our sole product candidate, imetelstat, a telomerase inhibitor, for the treatment of hematologic malignancies.
- Any suspension of or delays in the enrollment, conduct or completion of, our current Phase 3 clinical trials, IMerge Phase 3 or IMpactMF could result in increased costs to us, delay or limit our ability to generate revenue and adversely affect our commercial prospects.
- Any termination of either IMerge Phase 3 or IMpactMF would have a material adverse effect on our business that might cause us to cease operations.
- 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.
- If IMerge Phase 3 or IMpactMF fail to demonstrate safety and effectiveness to the satisfaction of the FDA or similar regulatory authorities in other countries, or do 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, which would have a material adverse effect on our business that might cause us to cease operations.
- 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.

Risks Related to COVID-19

- The COVID-19 pandemic has affected and continues to affect our ability to conduct clinical trial activities, causing delays in clinical site initiations and patient screening and enrollment in our clinical trials, IMerge Phase 3 and IMpactMF, and may delay and disrupt regulatory activities and our manufacturing and supply chain and have other adverse effects on our business and operations.

Risks Related to Our Financial Position and Indebtedness and Need For Additional Financing

- We will need to obtain substantial additional funding to complete the current Phase 3 clinical trials, IMerge Phase 3 and IMpactMF, and any commercialization of imetelstat, if approved. 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.

Risks Related to Regulatory Compliance Matters and Commercialization of Imetelstat

- Our failure to obtain regulatory approval for imetelstat in the U.S., would have a material adverse effect on our business that would likely cause us to cease operations.
- If we are not successful in commercializing imetelstat, we will not be able to achieve our projections for future revenue, if any.
- If imetelstat is approved for marketing and commercialization and we are unable to establish sales, marketing and distribution capabilities, we will be unable to successfully commercialize imetelstat if and when it is approved.

Risks Related to Protecting our Intellectual Property, Competition and Litigation

- 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.
- We and certain of our officers have been named as defendants in two pending putative securities class action lawsuits and seven 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.

Risks Related to Manufacturing Imetelstat

- We rely on contractors to manufacture and supply imetelstat and may be unable to ensure that we have adequate quantities of imetelstat for current and potential future clinical trials and potential commercial uses.

Risks Related to Information Technology Systems, Data Security and Data Privacy

- We are subject to government regulations and contractual obligations related to privacy and information security. Our actual or perceived failure to comply with such obligations could harm our business. Additionally, cyber-attacks or information security breaches that compromise our data or those of our partners or vendors could expose us to liability, affect our reputation and otherwise harm our business.
- Significant disruptions of information technology systems, including cloud-based systems, or breaches of data security could adversely affect our business.
- Changes in and failures to comply with United States federal and state as well as similar privacy and data protection laws, regulations and standards in other countries may adversely affect our business, operations and financial performance.

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 imetelstat on a timely basis, or at all.*

Imetelstat is our sole product candidate, upon whose success we are wholly dependent. We do not have any other products or product candidates. Our ability to develop imetelstat to and through regulatory approval and potential commercial launch is subject to significant risks and uncertainties, including, among other things, our ability to:

- obtain sufficient safety and efficacy data from IMerge Phase 3 and IMpactMF to support any application for regulatory approval, 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;
- obtain substantial additional capital in order to enable us to conduct our operations and to advance the imetelstat program through IMerge Phase 3 and IMpactMF and to complete the clinical, regulatory and potential commercialization activities necessary to bring imetelstat to market in lower risk MDS and refractory MF;
- 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;
- 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;
- achieve full enrollment in IMerge Phase 3 in the fourth quarter of 2021, and top-line results from IMerge Phase 3 in the first quarter of 2023;
- achieve adequate efficacy in IMerge Phase 3 to obtain regulatory approval, (i) in light of our decision to shorten 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, which may result in the exclusion of clinical responses that could occur after the earlier clinical cut-off date for the primary analysis, or (ii) for any other reason;
- obtain and maintain required regulatory clearances and approvals for 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 CROs, or to manufacture imetelstat, in each case at commercially reasonable costs;
- enter into and maintain arrangements with third parties, or establish internal capabilities, to provide sales, marketing, distribution and other commercialization functions in compliance with applicable laws, and maintain sufficient commercial resources to launch imetelstat;
- achieve acceptance of imetelstat, if approved, by patients and the relevant medical communities;
- compete effectively with other approved treatments;
- obtain appropriate coverage and reimbursement levels for the cost of imetelstat from governmental authorities, private health insurers and other third-party payors;
- obtain, maintain and enforce adequate intellectual property and regulatory exclusivity for imetelstat both in the United States and globally; and
- recruit and retain sufficient qualified and experienced personnel to support the development and potential commercialization of imetelstat, including to conduct and complete IMerge Phase 3 and IMpactMF, and potential future clinical trials of imetelstat.

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 of imetelstat, which would severely harm our business and prospects, and might cause us to cease operations.

IMerge Phase 3 and IMpactMF, and potential future clinical trials of imetelstat, could be interrupted, delayed, terminated or abandoned for a variety of reasons, including due to the COVID-19 pandemic, which could severely and adversely affect our financial results, business and business prospects, and the future of imetelstat, and might cause us to cease operations. *

Currently, the active clinical trials of imetelstat are IMerge Phase 2, IMerge Phase 3 and IMpactMF. 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 clinical trials, our operations and our business all of which depend on the continued worldwide progress toward managing this health crisis. Although vaccine distribution is gradually progressing in many countries, the emergence of COVID-19 variants and the resurgence of COVID-19 cases in certain regions of the world causes 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. As a result, the pace of enrollment in IMerge Phase 3 and IMpactMF trials has been slower than expected and may continue to be delayed. Under current planning assumptions, we expect IMerge Phase 3 to be fully enrolled in the fourth quarter of 2021. Based on current planning assumptions, including the revised 12-month follow-up period after last patient has been enrolled, we project top-line results from IMerge Phase 3 to be available in the first quarter of 2023. For IMpactMF, results are based on event-driven analyses. Under current assumptions, we expect that the interim analysis may occur in 2024 and the final analysis in 2025. However, because these analyses are event-driven, the results may be available at different times than currently expected. In addition, the conduct and completion of IMerge Phase 3 and IMpactMF, and commencement and conduct of any potential future clinical trials of imetelstat, could be interrupted, delayed or abandoned for a variety of reasons, including as a result of failures or delays related to:

- overcoming enrollment challenges related to the effects of the COVID-19 pandemic in IMerge Phase 3, and successfully retaining patients in, and conducting and completing, IMerge Phase 3;
- overcoming enrollment and operational challenges related to opening new clinical sites and conducting and completing IMpactMF due to the effects of the COVID-19 pandemic, while also competing with clinical trials for other investigational drugs in the same patient population;
- obtaining and/or maintaining regulatory clearances in the United States 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 IMerge Phase 3 and IMpactMF, or commencing potential future clinical trials of imetelstat;
- maintaining the 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 regulatory authorities;
- contracting with a sufficient number of clinical trial sites to conduct current and potential future clinical trials, 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;
- 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 of imetelstat, or other clinical trial materials, in a manner that meets the quality standards of the FDA and other regulatory authorities, and responding to any disruptions to drug supply, clinical trial materials or quality issues that may arise, including as a result of limitations in available manufacturing capacity due to obligations to manufacture and distribute vaccines to address the COVID-19 pandemic; temporary or permanent shut down of contract manufacturing facilities due to violations of good manufacturing practices, or GMP, regulations or other applicable requirements; or infections or cross-contaminations of product candidates in the manufacturing process or capacity limitations;
- ensuring the ability to manufacture and supply imetelstat at acceptable costs for potential future clinical trials of imetelstat;
- obtaining sufficient quantities of any study-related treatments, materials (including BAT, comparator products, placebo or combination therapies) or ancillary supplies, including in light of challenges and delays that may arise from the effects of the COVID-19 pandemic;

- 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 United States 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 IMerge Phase 3 and IMpactMF, or commencing other 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 design we may seek for IMerge Phase 3 and IMpactMF, or as a result of changes in regulatory requirements and policies, which could, for example, prevent us from conducting or completing IMerge Phase 3 or IMpactMF, 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 regulatory authorities in other countries 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 IMerge Phase 3 and IMpactMF, 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, and might cause us to cease operations.

Further difficulties enrolling or retaining patients in IMerge Phase 3 and IMpactMF, whether as a result of the effects of the COVID-19 pandemic 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, and we might cease operations.*

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 screening, enrolling and retaining patients in IMerge Phase 3 and IMpactMF, whether as a result of the effects of the COVID-19 pandemic or for any other reasons, may further delay our conduct of such trials, or cause them to be discontinued. If we experience difficulties in retaining patients in the treatment or follow-up phase of IMerge Phase 2, whether as a result of the effects of the COVID-19 pandemic or for any other

reasons, our ability to continue to assess longer-term durability of RBC-TI responses would be adversely affected. The enrollment and retention of patients in IMerge Phase 3 and IMpactMF, 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;
- the design of the trial, including potential patients' reluctance to participate in the trial due to the possibility of being assigned to a placebo control arm;
- 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 any new drugs that have been approved (e.g., Reblozyl® for lower risk MDS) 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;
- reduced availability of patients due to the recent approval of Reblozyl® in lower risk MDS;
- monitoring patients adequately during and after treatment;
- the ability to obtain and maintain patient consents; 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, COVID-19 or COVID-19-related site activities and restrictions, alternate treatments being approved for the indication, or personal issues.

In addition, IMerge Phase 3 and IMpactMF, as well as potential future clinical trials of imetelstat, 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, 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 IMerge Phase 3 or IMpactMF, based on efficacy and safety results reported to date and that may be reported in the future.

Delays caused by the effects of the COVID-19 pandemic 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, such as IMerge Phase 3 or IMpactMF, which could delay or prevent the commencement, conduct or completion of these trials and adversely affect the clinical development and potential commercialization of imetelstat. Such occurrences would severely and adversely affect our financial results, business and business prospects, and the future of imetelstat, and might cause us to cease operations.

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 or IMpactMF. 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 2, IMerge Phase 3, IMpactMF or any potential future clinical trial of imetelstat, experience similar or more severe adverse events, or new or unusual adverse events, or if the FDA or other 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 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, which might cause us to cease operations. In any event, if such toxicities or other safety issues in any clinical trial of imetelstat are determined by us, the FDA or similar regulatory authorities in other countries 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 regulatory authorities in other countries 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 regulatory authorities in other countries;
- 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 2, IMerge Phase 3 and IMpactMF 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 potential commercialization of imetelstat by us, as well as increase costs to develop imetelstat, which would have a severe adverse effect on our results of operations, financial condition, 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 less reliable than trials with a larger number of patients. As a result, there may be less certainty that imetelstat would 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 expect the data from the primary analysis as of the earlier clinical cut-off date to be sufficiently mature to assess the safety and efficacy of imetelstat, including durability of transfusion independence, our decision to shorten the follow-up period after the last patient has been enrolled may result in clinical responses that could occur after the 12-month clinical cut-off date being excluded from the primary analysis. The exclusion of this data from the primary analysis could reduce the overall top-line efficacy results, including durability of transfusion independence,

which could result in the trial's failure, or could limit or prevent marketing approval of imetelstat in lower risk MDS by the FDA or regulatory authorities in other countries.

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 regulatory authorities in other countries, could result in the trial's failure, or could otherwise delay, limit or prevent marketing approval of imetelstat in refractory MF by the FDA or regulatory authorities in other countries.

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 IMerge Phase 2 and IMbark, does not ensure that later clinical trials will be successful, nor does it predict final clinical trial results. 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 IMerge Phase 2, the initial data review for the 25-patient expansion cohort that was conducted by our former collaboration partner in the second quarter of 2018, referred to as a "data snapshot," exhibited an eight-week RBC-TI rate of 28%, while the 13-patient initial cohort exhibited an eight-week RBC-TI rate of 54%, resulting in an overall eight-week RBC-TI rate of 37% for the combined cohorts. Patients in both the initial and expansion cohorts were naïve to both HMA and lenalidomide and were non-del(5q). We believe the observed difference in eight-week RBC-TI rate between the 13-patient initial cohort and the 25-patient expansion cohort may be attributable to factors such as the maturity of the data at the time of the data snapshot, since the median follow-up time of the expansion cohort at the time of the data snapshot was less than half the length of time the 13-patient initial cohort had been followed when their data were first reported, or the higher overall baseline transfusion burden of the expansion cohort. Although the latest reported eight-week RBC-TI rate in June 2020 is higher than that reported in the data snapshot from the second quarter of 2018, we cannot assure you that the eight-week RBC-TI rate reported for the combined cohorts in IMerge Phase 2 will improve further with longer follow-up, or at all, or that the eight-week RBC-TI rate of patients enrolled in IMerge Phase 3 will be comparable to what has been reported in the 13-patient initial cohort, the 25-patient expansion cohort, or the combined cohorts in IMerge Phase 2. 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 IMerge Phase 2 and IMbark, and if this were to occur with IMerge Phase 3 or IMpactMF, this would adversely affect future development prospects of imetelstat and may cause us to cease operations.

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 myelofibrosis 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 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, reported at the EHA Annual Congress meeting in June 2019 suggest favorable OS for imetelstat-treated patients with Intermediate-2 or High-risk MF who have relapsed after or are refractory to prior treatment with a JAKi, or relapsed/refractory MF, 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 potential commercialization of imetelstat by us, which would have a severe adverse effect on our results of operations, financial condition, business prospects and the future of imetelstat, any of which might cause us to cease operations.

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 prior collaboration partner(s). For example, preliminary data from IMerge Phase 2 were reported at the ASH Annual Meetings in December 2017, December 2018 and December 2020, and at the EHA Annual Congress meetings in June 2018, June 2019, June 2020 and June 2021. We expect similar reports or announcements of safety and efficacy data from us or clinical investigators as data continues to mature in IMerge Phase 2. 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. 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, and might cause us to cease operations.

Additional or updated safety and efficacy data from current or potential future imetelstat clinical trials may result in a benefit-risk profile that does not justify the continued development of imetelstat in a particular patient population, or at all. For example, because patients remaining in the treatment phase continue to receive imetelstat in IMerge Phase 2, efficacy and safety data continue to be generated from the trial and will continue to evolve until all patients have ceased treatment. More mature data that may be reported in the future from IMerge Phase 2, and any data reported from IMerge Phase 3 or IMpactMF, may materially differ from and be less positive than data previously reported from IMerge Phase 2 and 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 enrollment, completion and potential success of IMerge Phase 3 or IMpactMF, or cause us to abandon further development of imetelstat entirely.

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 hematologic myeloid 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 their imetelstat collaboration agreement with us.

Further delay, suspension or abandonment of the development of imetelstat in hematologic myeloid malignancies, including resulting from our inability to successfully enroll, conduct and complete IMerge Phase 3 and IMpactMF, and to plan for, commence, conduct and complete potential future clinical trials of imetelstat, could have a material adverse effect on the future of imetelstat and our business prospects, and we might cease operations.

We have limited experience as a company in conducting large-scale, late-stage clinical trials, such as IMerge Phase 3, IMpactMF, or potential future similar trials, and no prior experience as a company in those functional areas that would be required for the successful commercialization of our sole product candidate, imetelstat.

Although we have hired individuals who have experience conducting Phase 3 clinical trials, as a company we have limited experience in conducting large-scale, late-stage clinical trials, such as IMerge Phase 3 or IMpactMF. We cannot be certain that we will be able to fully enroll, conduct or complete either trial, or any other potential future large-scale, late-stage clinical trial of imetelstat, in a timely fashion, or at all. These large-scale, late-stage clinical trials require internal development experience that we are beginning to develop; therefore, we still rely heavily on third-party clinical investigators, CROs, service providers, vendors, suppliers and consultants. Relying on these third parties and establishing effective and collaborative relationships with them to conduct large-scale, late-stage clinical trials may cause delays that are outside of our control. Any such delays could have a material adverse effect on our business.

We do not have experience as a company with activities that would be required for the commercialization of imetelstat, should we receive future regulatory approval to do so. Developing an internal sales, marketing and distribution capability is an expensive and time-consuming process, and will require additional management expertise. We may not be able to negotiate and enter into third-party marketing and distribution agreements on terms that are economically attractive, or at all. Even if we do enter into such agreements, third-party marketers and distributors may not successfully market or distribute our sole product candidate, imetelstat.

Our inability to successfully plan, commence, enroll, conduct and complete large-scale, late-stage clinical trials, such as IMerge Phase 3, IMpactMF or potential future similar trials, or to successfully establish commercialization capabilities for imetelstat if we receive future regulatory approval to do so, would severely and adversely affect our financial results, business and business prospects, and the future of imetelstat, and might cause us to cease operations.

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 prevent us from enrolling, conducting or completing IMerge Phase 3 or IMpactMF, or could otherwise 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 any imetelstat clinical trials, including IMerge Phase 3 and IMpactMF, 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 regulatory authorities in other countries 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 regulatory authorities in other countries, 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 product produced under applicable current good manufacturing practices, or cGMP, 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. 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. Our ability to comply with these regulations and standards is 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, which would have a severe adverse effect on our results of operations, financial condition, business prospects and the future of imetelstat, any of which might cause us to cease operations.

Furthermore, the execution of clinical trials and the subsequent compilation and analysis of the data produced, 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 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 additional 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 interpretation 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.

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 clinical sites involved with IMerge Phase 3 and planned clinical sites for IMpactMF.*

Our business and business prospects, our financial condition 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 limited voluntary access to our offices in California and New Jersey to employees who have been vaccinated, but almost all of our employees continue to work remotely. 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 the clinical trial;
- ensure patient clinical and lab collection visits;
- 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.

For IMerge Phase 3, we have clinical trial sites in many countries that have had high incident rates of COVID-19 or are experiencing a resurgence of COVID-19 cases. 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 opening, initiating and monitoring clinical trial sites. Although vaccine distribution is progressing gradually in many countries, the emergence of COVID-19 variants and the resurgence of COVID-19 cases in certain regions of the world causes further uncertainty and unpredictability on 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 IMerge Phase 3 and IMpactMF, due to the COVID-19 pandemic. Taking into account the dynamic and evolving circumstances of the COVID-19 pandemic on our clinical trial activities, under current planning assumptions, we expect IMerge Phase 3 to be fully enrolled in the fourth quarter of 2021. Based on current planning assumptions, including the revised 12-month follow-up period after the last patient has been enrolled, we project that top-line results from IMerge Phase 3 will be available in the first quarter of 2023. However, if full enrollment in IMerge Phase 3 completes after the fourth quarter of 2021, top-line results will not be available in the first quarter of 2023. If top-line results from IMerge Phase 3 are not available until after the end of the first quarter of 2023 or we are unable or unwilling to draw down the second tranche of the Loan Agreement, whether due to our inability to meet the required clinical milestones in order to draw down the second tranche or otherwise, we will require additional capital to reach top-line results in IMerge Phase 3.

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. Given these challenges, under current planning assumptions, we expect that the interim analysis may occur in 2024 and the final analysis in 2025. Because IMpactMF results are based on event-driven analyses, the results may be available at different times than currently expected.

If the effects of the COVID-19 pandemic continue and persist for an extended period of time and/or become more severe, we could experience further disruptions to our clinical development timelines, continued delays in enrollment and clinical trial site initiation in IMerge Phase 3 and IMpactMF, 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 clinical and lab collection visits, and uncertainty how the FDA will view deviations from the protocol 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 due to reduced availability of personnel at CROs and vendors;
- 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 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;
- interruption of, or delays in receiving, supplies of imetelstat from our CMOs due to among other things, staffing shortages, production slowdowns or stoppages, 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;
- 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, 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 IMerge Phase 3 and IMpactMF and any other 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 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 continue and persist for an extended period of time and/or become more severe, we may experience significant disruptions to our clinical development timelines, which would materially and adversely affect our business and business prospects, our financial condition and the future of imetelstat.

While at this time we believe that we have sufficient drug supply for IMerge Phase 3 and IMpactMF, 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, closures and other restrictions resulting from the COVID-19 outbreak 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. For example, we have experienced manufacturing schedule delays at one of our contract manufacturers due to government mandated manufacturing of high priority COVID-19 vaccines in connection with Operation Warp Speed, and we anticipate such delays, or potential shortages of consumable manufacturing supplies, will continue throughout 2021.

The effects of the COVID-19 pandemic 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 and our ability to further advance the imetelstat program, including through IMerge Phase 3 and IMpactMF and conducting the clinical, regulatory and potential commercialization activities necessary to bring imetelstat to market in lower risk MDS and refractory MF. If top-line results from IMerge Phase 3 are not available until after the end of the first quarter of 2023 or we are unable or unwilling to draw down the second tranche of the Loan Agreement, whether due to our inability to meet the required clinical milestones in order to draw down the second tranche or otherwise, we will require additional capital to reach top-line results. In addition, the global economic slowdown caused by the COVID-19 pandemic could materially and adversely affect our business and the value of our common stock.

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 as the ultimate duration and severity of the pandemic, travel restrictions, quarantines, social distancing and business closure requirements in the United States and in other countries, and the effectiveness of actions taken globally to contain and treat COVID-19. 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. 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 REGULATORY COMPLIANCE MATTERS AND COMMERCIALIZATION OF IMETELSTAT

Our inability to 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 United States 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.

Before we can seek to obtain regulatory approval for the commercial sale of imetelstat, we need to demonstrate that imetelstat is safe and effective in IMerge Phase 3, IMpact MF or potential additional clinical trials of imetelstat. We will need to complete significant additional research, manufacturing activities and clinical testing as well as other assessments before we can submit any application to the FDA or similar regulatory authorities in other countries for regulatory approval of imetelstat, including confirming compliance with EMA and FDA regulatory commitments.

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 regulatory authorities in other countries, could result in the trial's failure, or could otherwise delay, limit or prevent marketing approval of imetelstat for refractory MF by the FDA or regulatory authorities in other countries.

Furthermore, 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 expect the data from the primary analysis as of the earlier clinical cut-off date to be sufficiently mature to assess the safety and efficacy of imetelstat, including durability of transfusion independence, our decision to shorten the follow-up period after the last patient has been enrolled may result in clinical responses that could occur after the 12-month clinical cut-off date being excluded from the primary analysis. The exclusion of this data from the primary analysis could reduce the overall top-line efficacy results, including durability of transfusion independence, which could result in the trial's failure, or could limit or prevent marketing approval of imetelstat in lower risk MDS by the FDA or regulatory authorities in other countries.

If imetelstat cannot be successfully developed in our current Phase 3 clinical trials, IMerge or IMpactMF, our business and business prospects would be severely and adversely affected, and we might cease operations. Even if we do successfully complete one or more of our Phase 3 clinical trials of imetelstat, the results will not necessarily be predictive of imetelstat activity in new indications

and for future pivotal trials that may be needed to support any application to the FDA or similar regulatory authorities for such new indications. 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.

Obtaining potential future regulatory clearances to market imetelstat in the United States and other countries is a costly and lengthy process, and we cannot predict when or if regulatory authorities will approve imetelstat for commercial sale.

The process of obtaining marketing approvals, both in the United States and in other countries, is lengthy, expensive and uncertain. It may take many years, 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 or refractory MF, which would significantly harm our business, business prospects 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 United States and an MAA in the EU. As a company, we have not previously submitted an NDA or similar applications to comparable regulatory authorities in other countries for imetelstat.

Imetelstat must receive all relevant regulatory approvals before it may be marketed in the United States 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;
- unfavorable benefit-to-risk assessment, in the case of marginal efficacy and/or clinically relevant safety concerns;
- 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;
- 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 other regulatory authorities regarding the time period when our former collaborator was responsible for the imetelstat program;
- requirement to develop a risk evaluation and mitigation strategy 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;
- deficiencies in the manufacturing processes or facilities of our third-party contract manufacturers; or
- 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.

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 United Kingdom left the European Union, or the EU, on January 31, 2020, commonly referred to as Brexit, and its withdrawal from the EU was completed on December 31, 2020. Although the impact of the withdrawal of the United Kingdom from the EU will not be known for some time, it has resulted in uncertainty in relation to the regulatory process in the United Kingdom, 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 United Kingdom. Such regulatory changes in the United Kingdom or elsewhere could adversely affect and/or delay our ability to obtain approval of, and market and sell, imetelstat in the United States 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. 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, the price of our common stock, our business and business prospects, and the future of imetelstat, and might cause us to cease operations.

Although orphan drug designation has been granted to imetelstat for the treatment of MF and MDS in the United States 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 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 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 lower 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.

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.

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;
- 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.

Failure to comply with regulatory requirements can result in severe civil and criminal penalties, including but not limited to:

- recall or seizure of products;
- injunctions against the import, manufacture, distribution, sales and/or marketing of products; and
- criminal prosecution.

The imposition of any of these penalties or other commercial limitations would severely and adversely affect our financial results, business and business prospects, and the future of imetelstat, and might cause us to cease operations.

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 further delay in our ability to obtain regulatory approvals of imetelstat, and our business and business prospects could be severely harmed, and we could cease operations.

Although we have purchased inventories of drug product, drug substance and raw materials that meet our specifications from our former collaboration partner under a supply agreement, some of this material will require further processing in order to be used in clinical trials, and/or may also require regulatory review and acceptance prior to use. In addition, while we have re-established our own manufacturing supply chain in order to further process such purchased materials as well as to be able to manufacture and supply additional quantities of imetelstat that meet 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, and to establish commercial supply agreements;
- reliance on third-party CMOs 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 the COVID-19 pandemic;
- 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 supply chain capable of providing imetelstat for IMerge Phase 3, IMpactMF, and/or other potential future clinical trials of imetelstat, and potential future commercial uses, which would delay or result in a cessation of IMerge Phase 3, IMpactMF, or other 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 contractors 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 contractors to supply starting materials, drug substance and drug product. Failure by such third-party contractors to perform in a timely manner, 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. We may not be able to obtain imetelstat from third-party contractors on acceptable terms, or at all. We expect to rely on third-party contractors 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;
- 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; for example, we have experienced manufacturing schedule delays at one of our contract manufacturers due to government mandated manufacturing for high priority COVID-19 vaccines in connection with Operation Warp Speed, and we anticipate that such delays, or potential shortages of consumable manufacturing supplies, will continue throughout 2021;
- requirements by regulatory authorities for significant activities to validate and qualify any replacement manufacturer, which could involve new testing and compliance inspections;
- the inability to execute timely contracts with additional 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 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;
- 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 cGMP standards mandated by the FDA and state agencies and other government regulations corresponding to similar regulatory authorities in other countries;
- breach or termination of manufacturing or supply contracts;
- inadequate storage or maintenance at contracted facilities resulting in theft or spoilage;
- capacity limitation and scheduling imetelstat manufacturing activities as a priority in contracted facilities; 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 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 or commencement of other potential future clinical trials, 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, and might cause us to cease operations.

In addition, third-party contractors and/or any other contractors 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 contractors 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, if any, for us, which would materially and adversely affect our financial results, business and business prospects, and the future of imetelstat, and might cause us to cease operations.

RISKS RELATED TO OUR FINANCIAL POSITION AND NEED FOR ADDITIONAL FINANCING

Our failure to obtain substantial additional capital would force us to further delay, reduce or eliminate development of imetelstat, including IMerge Phase 3 and IMpactMF 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. Under current planning assumptions, we believe that our existing capital resources, together with future interest income and the $15.0 million second tranche draw down available to us under the Loan Agreement assuming certain clinical milestones are met, will be sufficient to fund our current level of operations until the end of the first quarter of 2023. Taking into account the dynamic and evolving circumstances of the COVID-19 pandemic on our clinical trial activities, under current planning assumptions, we expect IMerge Phase 3 to be fully enrolled in the fourth quarter of 2021. Based on current planning assumptions, including the revised 12-month follow-up period after last patient has been enrolled, we project top-line results from IMerge Phase 3 to be available in the first quarter of 2023. If top-line results from IMerge Phase 3 are not available until after the end of the first quarter of 2023 or we are unable or unwilling to draw down the second tranche of the Loan Agreement, whether due to our inability to meet the required clinical milestones in order to draw down the second tranche or otherwise, we will require additional capital to reach top-line results in IMerge Phase 3. In any event, we will require substantial additional funding to further advance the imetelstat program, including through IMerge Phase 3 and IMpactMF and conducting the clinical, regulatory and potential commercialization activities necessary to bring imetelstat to market in lower risk MDS and refractory MF. In addition, our ability to commercialize imetelstat in the United States, if regulatory approval is granted, depends on us being able to establish sales and marketing capabilities.

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, 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 will be further delayed or interrupted if COVID-19 pandemic conditions continue unabated, or worsen, creating further limitations on our clinical trial activities. 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 regulatory authorities in other countries;
- the scope, progress, duration, results and costs of current clinical trials, including IMerge Phase 3 and IMpactMF, and 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 IMerge Phase 3 or IMpactMF or any potential future clinical trials of imetelstat, whether as a result of the effects of the COVID-19 pandemic or for any other reasons;
- the costs, timing and outcomes of regulatory reviews or other regulatory actions related to imetelstat, such as obtaining and maintaining regulatory clearances and approvals for IMerge Phase 3 and IMpactMF in the United States 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 CMOs, 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 United States and other countries, and the associated costs;
- the costs and timing necessary to build a sales force in the United States to market and sell imetelstat, should it receive regulatory approval;
- the sales price for imetelstat;
- the availability of coverage and adequate third-party reimbursement for imetelstat;
- expenses associated with the pending putative securities class action lawsuits and 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;
- the costs of maintaining and operating facilities in California and New Jersey, telecommunications and administrative oversight, as well as higher expenses for travel when travel becomes possible in light of the COVID-19 pandemic; and
- the costs of enabling our personnel to work remotely, including providing supplies, equipment and technology necessary for them to perform their responsibilities.

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 with any further delays in reporting results from IMerge Phase 3 or IMpactMF. For example, if top-line results from IMerge Phase 3 are not available until after the end of the first quarter of 2023 or we are unable or unwilling to draw down the second tranche of the Loan Agreement, whether due to our inability to meet the required clinical milestones in order to draw down the second tranche or otherwise, we will require additional capital to reach top-line results in IMerge Phase 3, which may not be possible for us to obtain on acceptable terms, or at all.

Additional financing through public or private debt or equity financings, including pursuant to the 2020 Sales Agreement with B. Riley Securities, the Loan Agreement to the extent available, 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 caused by the effects of the COVID-19 pandemic, 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. If we are unable to raise additional capital or establish alternative collaborative arrangements with third-party collaborative partners for imetelstat, the development 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 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, future interest income, and potential future sales of our common stock, including under the 2020 Sales Agreement with B. Riley Securities or potential future draw downs, if available, under our Loan Agreement, will be sufficient to fund our operating plans. In any event, we will continue to need substantial additional funds to meet operational needs and capital requirements to advance the imetelstat program in clinical development, including through IMerge Phase 3 and IMpactMF and potential commercialization of imetelstat in lower risk MDS and refractory MF, and our need for additional funds may arise sooner than planned. If adequate funds are not available on a timely basis, if at all, we may be unable to pursue further development, including completing IMerge Phase 3 and IMpactMF, or commencing, conducting or completing other potential future clinical trials of imetelstat, or pursuing potential commercialization of imetelstat, which would severely harm our business and we might cease operations.

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 June 30, 2021, our accumulated deficit was approximately $1.2 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 significant revenues. We have no ongoing collaboration agreement related to imetelstat and have no current plans to enter into any corporate collaboration, partnership or license agreements that result in revenues.

We also expect to experience increased negative cash flow for the foreseeable future as we fund our operations and imetelstat clinical development activities advance. 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 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. In addition, 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.*

Under the Loan Agreement, draw downs are available in three tranches, or Tranches A, B and C, subject to certain terms and conditions, including, with respect to Tranche B and Tranche C, achievement of certain clinical, financial and regulatory milestones. Concurrently with the closing of the Loan Agreement, we borrowed $25.0 million of Tranche A. In June 2021, we drew down the remaining $10.0 million available under Tranche A. If we do not achieve the specified clinical, financial and regulatory milestones, we will not be eligible to draw funds under Tranche B and Tranche C of the Loan Agreement, and we will need to obtain additional or alternative financing to advance our development of imetelstat. For example, if we are unable or unwilling to draw down Tranche B of the Loan Agreement, whether due to our inability to meet the required clinical milestones in order to draw down Tranche B or otherwise, we will require additional capital to reach top-line results in IMerge Phase 3. 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 Tranches B and C of 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 of imetelstat 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 other Tranches, 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 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 amended in August 2021, also contains financial covenants requiring us to maintain a cash balance in an amount greater than or equal to $30.0 million, commencing June 1, 2022, which balance minimum is reduced to $20.0 million upon achievement of certain regulatory milestones. Under the amended Loan Agreement, if we enter into certain licensing transactions, this cash covenant requirement would increase to $35.0 million. 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 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 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 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 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 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, 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 management or development personnel, or to maintain our current management and personnel. If we are unable to successfully retain, motivate and incentivize our existing personnel, or to attract, assimilate and retain other highly qualified management and senior development personnel in the future on

acceptable terms, our ability to further develop imetelstat will be impaired, and our business and the price of our common stock would be adversely impacted. As a result of our own policies, 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. The expansion of our workforce may require us to establish business offices or entities in jurisdictions outside of the U.S., 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 employment of personnel in such countries, jurisdictions and regions is multi-national and complex, we may 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. We may not successfully manage our imetelstat commercialization and development efforts effectively, including our current and potential future imetelstat clinical trials. 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.

We expect imetelstat to remain our sole product candidate for the foreseeable future. If we are unable to successfully develop or 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 oncology products or product candidates. As a result, we are and will be 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.

If imetelstat is approved for marketing and commercialization and we are unable to establish sales, marketing and distribution capabilities, we will be unable to successfully commercialize imetelstat if and when it is approved.

As a company, we have no sales, marketing or distribution capabilities or experience. To achieve commercial success for imetelstat, if approved, we must either develop, a sales and marketing organization, which would be expensive and time consuming, outsource these functions to other third parties, or use a hybrid model incorporating both of these approaches.

There are risks involved with both establishing our own sales and marketing 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 force and establish marketing capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses, which would be costly.

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, coverage or reimbursement, customer service, medical affairs and other support personnel;
- our inability to equip sales personnel with 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; and
- unforeseen costs and expenses associated with creating an independent sales and marketing organization.

If we enter into arrangements with third parties to perform sales, marketing and distribution services, 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 sell and market imetelstat or may be unable to do so on terms that are favorable to us. In entering into third-party marketing or distribution 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 sales and distribution capabilities or devote the necessary resources and attention to sell and market imetelstat effectively. If we do not establish sales and marketing capabilities successfully, either on our own or in collaboration with third parties, we will not be successful in commercializing imetelstat.

If we are unable to establish potential future collaborative arrangements for imetelstat, we 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 United States. We may seek another collaborative partner or partners, at an appropriate time, to assist us in the potential development and commercialization of imetelstat, especially outside the United States, 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 IMerge Phase 3 and 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 negotiate 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 new 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 United States;
- 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 substantial additional capital than our current resources.

In order to advance the imetelstat program, including through IMerge Phase 3 and IMpactMF, or to commence, conduct and complete other potential future clinical trials of imetelstat, as well as undertaking potential commercialization activities for imetelstat in the United States, we will need to raise substantial additional capital. In addition, if we elect to increase our expenditures to fund imetelstat development or commercialization activities outside the United States, 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 substantial additional capital, we will not be able to advance the imetelstat program, including through IMerge Phase 3 and IMpactMF or other potential future clinical trials of imetelstat, nor will we be able to bring imetelstat to market and 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 United States.

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 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 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 Phase 3 clinical trials, IMerge or IMpactMF, or 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, including IMerge Phase 3 or IMpactMF. 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 two pending putative securities class action lawsuits and seven 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 putative 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 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 complaint was filed on May 13, 2021. Discovery has commenced, although the Court has not yet entered a case schedule or set a trial date.

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 board members. 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. The court has not set a hearing date for the motion;
- 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 in the Chancery Court Derivative Lawsuits;
- The consolidated shareholder derivative actions filed in the Northern District have been stayed pending the Northern District's ruling on a motion by lead plaintiffs in the consolidated class action lawsuit to certify the putative class in the case; 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.

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 may incur substantial legal fees and costs in connection with such lawsuits. We currently are not able to estimate the possible cost to us from these matters, as the pending lawsuits are currently at an early stage, and we cannot be certain how long it may take to resolve the pending lawsuits or the possible amount of any damages 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. 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.

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 United States 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 United States 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 our product 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 our product 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 further delay or preclude any future development or commercialization of imetelstat by us. Further, 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 government 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 government 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. 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. 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, any of the foregoing could expose us to liability to the applicable patent 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 United States, 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.

Under the Hatch-Waxman Act, a patent may be eligible for future patent term extension of up to five years under certain circumstances. Depending upon the timing, duration and specifics of any potential marketing approval of imetelstat, one or more 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 United States, such as in Japan and in Europe. 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. 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. 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 United States, 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, 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 2025. If we do not receive marketing approval and submit a request for patent term extension for our European composition of matter patents for imetelstat before our patents expire in 2024, our European composition of matter patents will expire in 2024. Similarly, if we do not receive marketing approval in certain non-European countries before our composition of matter patents expire in 2024, our composition of matter patents in such countries will expire in 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 United States 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 United States 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 United States 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 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 United Kingdom left the EU on January 31, 2020, commonly referred to as Brexit. The impact of the withdrawal of the United Kingdom 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 supplementary protection certificates of imetelstat based on our United Kingdom patents and our ability to establish and maintain European trademarks in the United Kingdom. In 2012, the European Patent Package, or EU Patent Package, regulations were passed with the goal of providing for a single pan-European Unity Patent, and a new European Unified Patent Court, or UPC, for litigation of European patents. It is uncertain that implementation of the EU Patent Package will occur. If the EU Patent Package is ratified and in effect, all European patents, including those issued prior to ratification, would by default automatically fall under the jurisdiction of the UPC and allow for the possibility of obtaining pan-European

injunctions. Under the EU Patent Package as currently proposed, once the UPC is established, patent holders are permitted to "opt out" of the UPC on a patent-by-patent basis, although the time permitted for this opt-out is not yet known. Owners of traditional European patent applications who receive notice of grant after the EU Patent Package is ratified could 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. 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 United States 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 on imetelstat and our technologies in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States are less extensive than those in the United States. 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 United States under any future license agreements. In addition, the laws of some countries outside the United States do not protect intellectual property rights to the same extent as federal and state laws in the United States. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, even in jurisdictions where we pursue patent protection, or from selling or importing products made using our inventions in and into the United States 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 United States. 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 United States. 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 United States 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 United States 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. 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 licenses to those patents or other proprietary rights or develop or obtain alternative technologies. 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. If that were to occur, we might need 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. 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.

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. Any infringement claims against us would likely be expensive to resolve, and the cost of any unblocking license that we could be required to obtain is unpredictable and could be significant. 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 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 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 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 hematologic myeloid 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.

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.; and Reblozyl (luspatercept), a TGF-beta inhibitor, by Acceleron Pharma, Inc., or Acceleron, in collaboration with Celgene.

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.; and APR-246, an activator of p53 protein, by Aprea Therapeutics, Inc.

In addition, there are multiple Phase 1 and Phase 2 clinical trials of other agents for lower risk MDS, including but not limited to: LB-100, a PP2A inhibitor being developed by Lixte Biotechnology Holdings, Inc.; bemcentinib, an AXL inhibitor being developed by BerGenBio ASA; H3B-8800, a spliceosome inhibitor being developed by H3 Biomedicine, Inc.; and KER-050, a TGF-beta inhibitor being developed by Keros Therapeutics, Inc.

If approved for commercial sale for the treatment of MF, imetelstat would compete against currently approved JAK inhibitors: Jakafi (ruxolitinib) by Incyte Corporation and Inrebic (fedratinib) by Celgene. 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 pacritinib, a JAK inhibitor, by CTI Biopharma; momelotinib, a JAK inhibitor, by Sierra Oncology; pelabresib, a BET inhibitor, by Constellation Pharmaceuticals, Inc.; navitoclax, a BCLXL, BCL-2 and BCLW inhibitor, by AbbVie, Inc.; and parsaclisib, a PI3K delta inhibitor, by Incyte Corporation. Other approaches for MF currently under investigation that could compete with imetelstat in the future include luspatercept, a TGF-beta inhibitor, by Acceleron, in collaboration with Celgene; PRM-151, an anti-fibrosis antibody, by Promedior, Inc.; 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; ING-41, a selective GSK-3b inhibitor, by Actuate Therapeutics, Inc.; XPOVIO (Selinexor), a nuclear export inhibitor, by Karyopharm Therapeutics, Inc.; TL-895, a tyrosine kinase inhibitor, by Telios Pharma, Inc.; IMG7289, a LSD1 inhibitor, by Imago Biosciences, Inc.; and APG-1252, a dual BCL-2/BCL-XL inhibitor, by Ascentage Pharma.

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 hematologic myeloid 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.

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 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 other 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;
- the effectiveness of sales, marketing and distribution support for imetelstat;
- the extent to which imetelstat is approved for inclusion on formularies in hospitals and managed care organizations;
- the pricing of imetelstat;
- 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 pharmacoeconomic advantage for imetelstat compared to established or standard-of-care therapies, or newly developed therapies, for hematologic myeloid malignancies. Third-party payors may decide that any potential improvement that imetelstat may provide to clinical outcomes in hematologic myeloid 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, and might cause us to cease operations.

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 United States. 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 regulatory authorities in other countries. 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.

The adoption of health policy changes and healthcare reform in the United States may adversely affect our business and financial results.*

In the United States and some jurisdictions outside the United States, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could impact our business. For example, in response to the COVID-19 pandemic, the CARES Act was signed into law in March 2020. The CARES Act is aimed at providing emergency assistance and healthcare for individuals, families and businesses affected by the COVID-19 pandemic and generally supporting the U.S. economy. Generally, there has been increasing legislative and enforcement interest in the United States 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. While a number of reform measures may require additional authorization to become effective, Congress and the Biden Administration have each indicated that they will continue to seek new legislative and/or administrative measures to control drug costs. Further, based on a recent executive order, the Biden administration expressed its intent to pursue certain policy initiatives to reduce drug prices. 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. The effects of the COVID-19 pandemic may introduce temporary or permanent healthcare reform measures, which could have negative financial implications on our business.

The United States 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. While Congress has not passed comprehensive repeal legislation, several bills affecting the implementation of certain taxes under the ACA have been signed into law. The Tax Cuts and Jobs Act of 2017, or Tax Act, includes a provision which repealed, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year, that is commonly referred to as the “individual mandate.” In addition, the 2020 federal spending package permanently eliminated, effective January 1, 2020, the ACA-mandated

“Cadillac” tax on high-cost employer-sponsored health coverage and medical device tax and, effective January 1, 2021, also eliminated the health insurer tax.

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. Thus, the ACA will remain in effect in its current form. 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 from February 15, 2021 through May 15, 2021 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. It is possible that the ACA will be subject to judicial or Congressional challenges in the future. 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.

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. For a discussion of additional health reform activity, see Item 1 “Business—Government Regulation—Reimbursement and Healthcare Reform” in the Form 10-K.

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, as amended by the Health Information Technology for Education and Clinical Health Act; 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 the Form 10-K.

Additionally, efforts to ensure that our current and future business arrangements will comply with applicable healthcare, privacy and data security laws and regulations will involve substantial costs. For example, the General Data Protection Regulation (GDPR) (EU) 2016/679, or the GDPR, which became effective on May 25, 2018, imposes requirements relating to the consent of the individuals to whom the personal data relates, the information provided to the individuals, the security and confidentiality of the personal data, data breach notification and the use of third-party processors in connection with the processing of personal data. The GDPR also imposes strict rules on the transfer of personal data out of the EU, provides an enforcement authority and authorizes the imposition of large penalties 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. In June 2021, the European Commission adopted new standard contractual clauses establishing data protection safeguards for cross-border personal data transfers under the GDPR, and we will likely be required to put in place additional contractual provisions and technology systems to comply with the GDPR under the new standard contractual clauses. The GDPR has increased our responsibility and potential liability in relation to personal data that we process or control compared to prior EU law, including in clinical trials, which could divert management’s attention and increase our cost of doing business. Likewise, we expect that there will continue to be new proposed laws, regulations and industry standards relating to

privacy and data protection in the United States, the EU and other jurisdictions, such as the California Consumer Privacy Act of 2018, or CCPA, that became effective on January 1, 2020, which has been characterized as the first "GDPR-like" privacy statute enacted in the United States because it mirrors a number of the key provisions in the GDPR, and we cannot determine the impact such laws, regulations and standards will have on our business. In any event, it is possible that governmental authorities will conclude that our business practices do not comply with current or future statutes, regulations, agency guidances or case law involving applicable healthcare or privacy laws, including the GDPR, in light of the lack of applicable precedent and regulations.

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 other 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 preclinical 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.

Historically, our stock price has been extremely volatile. Between April 1, 2011 and June 30, 2021, our stock has traded as high as $7.79 per share and as low as $0.75 per share. Between April 1, 2020 and June 30, 2021, the price has ranged between a high of $2.40 per share and a low of $0.95 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 the research and development of imetelstat, or results of, further delays in the commencement, enrollment or conduct of, discontinuation of, or further modifications or refinements to any clinical trials of imetelstat, including IMerge Phase 3 or IMpactMF, for any reason, or our inability, for any reason, to successfully continue the development of imetelstat;
- having sufficient financial resources to reach top-line results in IMerge Phase 3;

- obtaining substantial additional capital, on commercially reasonable terms, necessary to advance the imetelstat program, including through IMerge Phase 3 and IMpactMF and conducting the clinical, regulatory and potential commercialization activities necessary to bring imetelstat to market in lower risk MDS and refractory MF;
- preliminary, interim or final clinical trial data 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 United States, including, if we do not obtain regulatory clearance to commence, modify, conduct or continue clinical trials of imetelstat in MF, MDS or any additional hematologic myeloid malignancies in a timely manner or at all;
- announcements regarding the safety of imetelstat and partial or full clinical holds placed on the imetelstat INDs by the FDA or other regulatory authorities, or other regulatory developments related to imetelstat;
- the experimental nature of imetelstat;
- the terms and timing of any future collaboration agreements for the development and potential commercialization of imetelstat that we may establish;
- the demand in the market for our common stock;
- announcements of technological innovations, new commercial products, or clinical progress or lack thereof by us, potential future collaborative partners or our competitors;
- 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 the COVID-19 pandemic;
- perceptions of the biotechnology and pharmaceutical industry by the public, legislature, regulators and the investment community;
- announcements concerning imetelstat proprietary rights;
- comments by securities analysts or other third parties, including blogs, articles and other media;
- large stockholders exiting their position in our common stock or an increase in the short interest in our common stock;
- announcements of or developments concerning pending and potential future litigation;
- the issuance of common stock to partners, vendors or investors to raise additional capital; 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 the COVID-19 pandemic, could materially and adversely affect the market price of our common stock and the return on our stockholders’ 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 two pending putative securities class action lawsuits and seven 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 two of our officers have been named as defendants in two putative class action lawsuits. In addition, certain of our current officers and current and former board members have been named as defendants in the Derivative Lawsuits filed in the Northern District, the Court of Chancery of the State of Delaware, the District Court for the District of Delaware and the California Superior Court for the County of San Mateo, 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 IMerge Phase 3 and IMpactMF and/or could preclude or delay potential future clinical trials, or could preclude or delay commercialization efforts.

We may fail to continue to meet the listing standards of Nasdaq, and as a result our common stock may be delisted, which could have a material adverse effect on the liquidity of our common stock.

Our common stock currently trades on The Nasdaq Global Select Market. The Nasdaq Stock Market LLC has requirements that a company must meet in order to remain listed on Nasdaq. In particular, Nasdaq rules require us to maintain a minimum closing bid price of $1.00 per share of our common stock. On March 12, 2020, the closing price of our common stock was $0.99 per share, and while the closing price of our common stock rose to $1.03 per share on March 19, 2020, and has subsequently remained at or above the minimum closing bid price of $1.00 per share from March 19, 2020 through the date of this filing, it may in the future fall below the closing minimum bid price of $1.00 per share. If the closing bid price of our common stock were to remain below $1.00 per share for 30 consecutive trading days, or we do not meet other listing requirements, we would fail to be in compliance with Nasdaq's listing standards. There can be no assurance that we will continue to meet the minimum bid price requirement, or any other requirement in the future. If we fail to meet the minimum bid price requirement once the temporary suspension is lifted, The Nasdaq Stock Market LLC may initiate the delisting process with a notification letter. If we were to receive such a notification, we would be afforded a grace period of 180 calendar days to regain compliance with the minimum bid price requirement. In order to regain compliance, shares of our common stock would need to maintain a minimum closing bid price of at least $1.00 per share for a minimum of 10 consecutive trading days. In addition, we may be unable to meet other applicable Nasdaq listing requirements, including maintaining minimum levels of stockholders' equity or market values of our common stock, in which case our common stock could be delisted. If our common stock were to be delisted, the liquidity of our common stock would be adversely affected, and the market price of our common stock could decrease.

The sale of a substantial number of shares may adversely affect the market price of our common stock.*

As of June 30, 2021, we had 675,000,000 shares of common stock authorized for issuance and 320,599,195 shares of common stock outstanding. In addition, we had reserved 134,340,048 shares of our common stock for future issuance pursuant to our option and equity incentive plans and outstanding warrants as of June 30, 2021.

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 Securities, 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 options and shares of common stock reserved for issuance under our 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 your 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

Significant disruptions of information technology systems, including cloud-based systems, or breaches of data security could adversely affect our business.

Our business is increasingly dependent on critical, complex and interdependent information technology systems, including cloud-based systems, to support business processes as well as internal and external communications. 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. Our information technology systems, including in our remote work environment as a result of the COVID-19 pandemic, and those of our collaborators, service providers and contractors, are potentially vulnerable to breakdown, data corruption, malicious intrusion, malware, computer viruses, natural disasters, terrorism, war, and telecommunication and electrical failures that may result in damage to or the impairment of key business processes, or the unauthorized, unlawful or accidental loss, corruption, access, acquisition or disclosure of confidential information, such as clinical trial data or information, intellectual property, proprietary business information and personal information. Such disruptions and breaches of security could have a material adverse effect on our business, financial condition and operations. The costs to us to mitigate network security problems, bugs, viruses, worms, malicious software programs and security vulnerabilities could be significant, and while we have implemented security measures designed to protect our data security and information technology systems, our efforts to address these problems may not be successful, and these problems could result in unexpected interruptions, delays, cessation of service and other harm to our business and our competitive position. In addition, we rely on our collaborators, service providers, including our CROs, and contractors to establish and maintain appropriate information technology systems and data security protections. However, except for contractual duties and obligations, we have limited ability to control their safeguards and actions related to such matters. If such a breach were to occur and cause

interruptions in our operations, it could result in a material disruption of our imetelstat development program. For example, the loss of clinical trial data from completed, ongoing or planned clinical trials could result in delays in obtaining, or our inability to obtain, regulatory approvals and significantly increase our costs to recover or reproduce the data.

In addition, our information technology systems, as well as those of our collaborators, service providers and contractors, are potentially vulnerable to security breaches, whether by employees, contractors, consultants, malware, phishing attacks, or other cyber-attacks, that may expose confidential information, intellectual property, proprietary business information or personal information to unauthorized persons. If a security breach affects our systems or those of third parties upon which we rely, corrupts our data or results in the unauthorized disclosure or release of personal information by our collaborators, service providers, contractors or us, our reputation could be materially damaged, and we could be subject to significant fines, increased costs or loss of revenue. In addition, such a breach may require notification to governmental agencies, supervisory bodies, credit reporting agencies, the media, individuals, collaborators or other relevant stakeholders pursuant to various federal. state and foreign data protection, privacy and security laws, regulations and guidelines, our privacy notices, as well as contracts, if applicable. These may include state data breach notification laws and the GDPR. Accordingly, a data security breach or privacy violation that leads to unauthorized access to, acquisition, disclosure or modification of personal information (including health information), that prevents access to personal information or materially compromises the privacy, security, availability, integrity or confidentiality of the personal information, could result in processing penalties, fines, increased costs or loss of revenue as a result of:

- harm to our reputation;
- additional compliance obligations or enforcement measures under U.S. federal and state laws, and foreign laws;
- remediation and corrective action we undertake as required by law or as otherwise necessary;
- litigation and potential civil or criminal liability; and
- requirements to verify the accuracy of affected data.

Many of our contracts with relevant stakeholders such as collaborators include obligations to use industry-standard or reasonable measures to safeguard personal information. A security breach could lead to claims against us by relevant stakeholders. In addition, our non-compliance with our data privacy obligations in our contracts, or our inability to ensure that our service providers also comply with such obligations to relevant stakeholders, may cause us to breach our contracts. As a result, we could be subject to legal action or the relevant stakeholders could end their relationships with us. 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 or damages.

If we are unable to prevent data security breaches or privacy violations or implement satisfactory remedial measures, our operations could be disrupted, and we may suffer loss of reputation, financial loss and other regulatory penalties because of lost or misappropriated information, including sensitive study participant data. In addition, breaches and other compromises of our data can be difficult to detect, and any delay in identifying them may lead to increased harm of the type described above. Moreover, the prevalent use of mobile devices that access our information increases the risk of data security breaches, which could lead to the loss of confidential information, trade secrets or other intellectual property. While we have implemented security measures designed to protect our information technology systems, because the techniques used to compromise our systems, obtain unauthorized access, disable or degrade service, or sabotage systems, change frequently, become more sophisticated, and often are not recognized until launched against a target, we or our collaborators, service providers or contractors may be unable to anticipate these techniques or to implement adequate preventative measures. 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.

Changes in and failures to comply with United States federal and state as well as foreign privacy and data protection laws, regulations and standards may adversely affect our business, operations and financial performance.*

We are subject to or affected by numerous federal, state and foreign laws and regulations, as well as regulatory guidances, governing the collection, use, disclosure, retention, and security of personal data, such as information that we collect about study subjects and healthcare providers in connection with clinical trials in the United States and abroad. These laws, regulations and guidances 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 our or our collaborators', service providers' and contractors' ability to operate in certain jurisdictions or to collect, store, transfer, use and share personal information, 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. Any failure or perceived failure by us or our

collaborators, service providers and contractors to comply with federal, state or foreign laws or regulation, our internal policies and procedures or our contracts governing processing of personal information could result in negative publicity, diversion of management time and effort and proceedings (including investigations) against us by governmental entities or others. In many jurisdictions, enforcement actions and consequences for noncompliance are rising.

In the United States, California enacted the CCPA, which became effective in January 2020. The CCPA establishes a privacy framework for covered businesses, including an expansive definition of personal information and data privacy rights for California residents. The CCPA includes a framework with potentially severe statutory damages and private rights of action. The CCPA, in part, requires covered businesses to provide new disclosures to California residents and provide such residents new ways to opt-out of certain disclosures of personal information. In addition, the CCPA provides a private right action for data breaches, which is expected to increase data breach litigation. 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 the CPRA, will expand the CCPA on January 1, 2023 when the CPRA becomes operative. These laws exemplify the vulnerability of our business to the evolving regulatory environment related to personal data. As we expand our operations, these and similar laws may increase our compliance costs and potential liability. Some observers have noted that the CCPA could mark the beginning of a trend toward more stringent privacy legislation in the United States. For example, Virginia and Colorado have enacted privacy laws, the Consumer Data Protection Act and Colorado Privacy Act, respectively.

Our operations abroad may also be subject to increased scrutiny or attention from foreign data protection authorities. Many foreign jurisdictions have established or are in the process of establishing privacy and data security legal frameworks with which we, our collaborators, service providers, including our CROs, contractors and other relevant stakeholders must comply. For example, the EU adopted the GDPR, which went into effect in May 2018 and introduces strict requirements for processing the personal information of EU residents, including clinical trial data. The GDPR has and will continue to increase compliance burdens on us, including by mandating potentially burdensome documentation requirements and granting certain rights to individuals to control how we collect, use, disclose, retain and process information about them. The processing of sensitive personal data, such as physical health conditions, may impose heightened compliance burdens under the GDPR and is a topic of active interest among foreign regulators. In addition, the GDPR provides for more robust regulatory enforcement such as data processing penalties and monetary fines of up to €20 million or 4% of the annual global revenue of the noncompliant company, whichever is greater. As we expand into countries and jurisdictions outside the United States, we may be subject to additional laws and regulations that may affect how we conduct business.

European data protection laws, including the GDPR, generally restrict the transfer of personal information from Europe, including the European Economic Area (EEA), United Kingdom (U.K.) and Switzerland, to the United States and most other countries unless the parties to the transfer have implemented specific safeguards to protect the transferred personal information. For example, we became originally Privacy Shield certified by the U.S. Department of Commerce's International Trade Administration in April 2019. However, the Court of Justice of the EU (CJEU) invalidated the EU-U.S. Privacy Shield on July 16, 2020 and similarly, on September 8, 2020, the Swiss Federal Data Protection and Information Commissioner declared the Swiss-U.S. Privacy Shield inadequate to protect the transferred personal data. Nonetheless, the U.S. Department of Commerce continues to administer the Privacy Shield program to maintain the Privacy Shield Frameworks and we continue to be bound by the Privacy Shield obligations. In June 2021, the European Commission adopted a new set of Standard Contractual Clauses with respect to the transfer of EEA personal data to other jurisdictions that the European Commission has not determined to have an adequate level of protection for personal information (such as the United States), and may increase the legal risks and liabilities under the GDPR and local EU laws associated with cross-border personal data transfers, and result in material increased compliance and operational costs if we elect to rely upon the new Standard Contractual Clauses for cross-border personal information transfers out of the EEA. We have and may rely upon clinical trial participants' explicit consent to transfer their personal information from Europe to the United States and other countries. In certain cases, in the past, we have relied on the EU-U.S. Privacy Shield. We have and may rely upon the Standard Contractual Clauses as a mechanism for cross-border personal information transfers out of the EEA. If we are unable to rely on explicit consent to transfer individuals' personal information from Europe, which can be revoked, or implement another valid compliance mechanism, we may face increased exposure to regulatory actions, substantial fines and injunctions against processing or transferring personal information from Europe. Inability to import personal information from Europe to the United States or other countries may also limit our ability conduct clinical trial activities in Europe; collaborate with other entities subject to European data protection laws; and require us to increase our data processing capabilities in Europe at significant expense. Moreover, other countries outside of Europe have enacted or are considering enacting similar cross-border data transfer restrictions and laws requiring local data residency, which could increase the cost and complexity of delivering our services and operating our business.

Further, the U.K.'s decision to leave the EU, often referred to as Brexit, and ongoing developments in the U.K. have created uncertainty regarding data protection regulation in the U.K. Following December 31, 2020, and the expiry of transitional arrangements between the U.K. and EU, the data protection obligations of the GDPR continue to apply to UK-related processing of personal information in substantially unvaried form under the so-called 'UK GDPR' (i.e., the GDPR as it continues to form part of U.K. law by

virtue of section 3 of the EU (Withdrawal) Act 2018, as amended). However, going forward, there is increasing risk for divergence in application, interpretation and enforcement of the data protection laws as between the U.K. and EEA. Furthermore, the relationship between the U.K. and the EEA in relation to certain aspects of data protection law remains uncertain, including with respect to regulation of personal information transfers between EU member states and the UK. On June 28, 2021, the European Commission issued an adequacy decision under the GDPR which allows transfers (other than those carried out for the purposes of U.K. immigration control) of personal information from the EEA to the U.K. to continue without restriction for a period of four years ending June 27, 2025. During these four years, the European Commission will continue to monitor the legal situation in the U.K. and could intervene if the U.K. deviates from the level of data protection in place at the time it issued the adequacy decision. If the European Commission withdraws or does not renew the adequacy decision, transfers of personal information from the EEA to the U.K. will require a valid transfer mechanism and we may be required to implement new processes and put new agreements in place to continue making such transfers.

We publish privacy policies and other documentation regarding our collection, processing, use and disclosure of personal information. Although we endeavor to comply with our published policies and other documentation, 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 employees, collaborators, contractors, service providers or vendors fail to act in accordance with our published policies and documentation. Such failures can subject us to potential foreign, local, state and federal action if they are found to be deceptive, unfair, or misrepresentative of our actual practices. Moreover, 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. Claims that we have violated individuals' privacy rights or failed to comply with data protection laws or applicable privacy notices, even if we are not found liable, could be expensive and time-consuming to defend and could result in adverse publicity that could harm our business.

Compliance with applicable privacy and data security laws and regulations as well as contractual obligations is a rigorous and time-intensive process, and we may be required to put in place additional mechanisms to ensure compliance with such data protection obligations. If we fail to comply with any data protection obligations, we may face significant fines, penalties and litigation that could adversely affect our business, financial condition and results of operations.

GENERAL RISK FACTORS

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 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 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 significantly revised the Code. Future guidance from the U.S. Internal Revenue Service and other tax authorities with respect to the Tax Act may adversely affect us, and certain aspects of the Tax Act could be repealed or modified in future legislation with adverse effect on us. For example, the CARES Act modified certain provisions of the Tax Act. In addition, it is uncertain if and to what extent various states will conform to the Tax Act, the CARES 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 addition, our independent registered public accounting firm must provide an opinion annually on the effectiveness of our internal control over financial reporting.

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 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS

None.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES

None.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

ITEM 5. OTHER INFORMATION

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.

The foregoing descriptions of the terms of the amendment to the Loan Agreement is qualified in its entirety by reference to the Amendment to the Loan Agreement, which is being filed as Exhibit 10.1 hereto, and incorporated by reference herein.

ITEM 6. EXHIBITS

Exhibit Number	Description	Incorporation by Reference			
		Exhibit Number	Filing	Filing Date	File No.
3.1	Restated Certificate of Incorporation	3.1	8-K	May 18, 2012	000-20859
3.2	Certificate of Amendment of the Restated Certificate of Incorporation	3.3	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
10.1+^	Amendment to Loan and Security Agreement, dated August 12, 2021, amongst Registrant, Hercules Capital, Inc., and Silicon Valley Bank				
10.2	2018 Equity Incentive Plan, as amended*	10.1	8-K	May 13, 2021	000-20859
10.3+	2018 Inducement Award Plan, as amended May 11, 2021*				
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 August 16, 2021				
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 August 16, 2021				
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 August 16, 2021 **				
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 August 16, 2021 **				
101	The following materials from the Registrant's June 30, 2021 Quarterly Report on Form 10-Q for the quarter ended June 30, 2021 formatted in Inline Extensible Business Reporting Language (iXBRL) include: (i) Condensed Balance Sheets as of June 30, 2021 and December 31, 2020, (ii) Condensed Statements of Operations and Comprehensive Loss for the three and six months ended June 30, 2021 and 2020, (iii) Condensed Statements of Stockholders' Equity for the three and six months ended June 30, 2021 and 2020, (iv) Condensed Statements of Cash Flows for the six months ended June 30, 2021 and 2020 and (v) Notes to Condensed Financial Statements.				
104	The cover page from the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2021, has been formatted in Inline XBRL.				

+ Filed herewith.

^ Certain portions of this exhibit (indicated by asterisks) have been omitted as the Registrant has determined that (i) the omitted information is not material and (ii) the omitted information would likely cause competitive harm to the Registrant if publicly disclosed. The Registrant agrees to furnish supplementally an unredacted copy of any exhibit to the Securities and Exchange Commission upon request; provided, however, that the Registrant may request confidential treatment of omitted items.

* Management contract or compensation plan or arrangement.

** The certifications attached as Exhibits 32.1 and 32.2 that accompany this Quarterly Report on Form 10-Q, 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 Form 10-Q), irrespective of any general incorporation language contained in such filing.

SIGNATURES

Pursuant to the requirements 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: August 16, 2021

By: /s/ OLIVIA BLOOM
OLIVIA K. BLOOM
Executive Vice President, Finance, Chief Financial Officer and Treasurer
(Duly Authorized Officer and Principal Financial and Accounting Officer)

EXHIBIT 10.1

CERTAIN CONFIDENTIAL PORTIONS OF THIS EXHIBIT HAVE BEEN OMITTED AND REPLACED WITH "[***]". SUCH IDENTIFIED INFORMATION HAS BEEN EXCLUDED FROM THIS EXHIBIT BECAUSE IT IS (I) NOT MATERIAL AND (II) WOULD LIKELY CAUSE COMPETITIVE HARM TO THE COMPANY IF DISCLOSED.

FIRST AMENDMENT TO LOAN AND SECURITY AGREEMENT

THIS **FIRST AMENDMENT TO LOAN AND SECURITY AGREEMENT** (this "**Amendment**"), dated as of August 12, 2021 (the "**Amendment Effective Date**"), is entered into by and among Geron Corporation, a Delaware corporation ("**Borrower**"), each of its Subsidiaries (hereinafter collectively referred to as the **"Borrower"**") other than any Excluded Subsidiaries, and Silicon Valley Bank, a California corporation ("**SVB**"), HERCULES CAPITAL, INC., a Maryland corporation ("**Hercules**"), each as a Lender, the several banks and other financial institutions or entities from time to time party thereto (collectively, the "**Lenders**"), and Hercules, in its capacity as administrative agent and collateral agent for itself and the Lender (in such capacity, together with its successors and assigns in such capacity, "**Agent**").

The Borrower, the Lenders and Agent are parties to a Loan and Security Agreement dated as of September 30, 2020 (as amended, restated or modified from time to time, the "**Loan and Security Agreement**"). The Borrower has requested that Agent and Lenders agree to certain amendments to the Loan and Security Agreement. Agent and Lenders have agreed to such request, subject to the terms and conditions hereof.

Accordingly, the parties hereto agree as follows:

SECTION 1 Definitions; Interpretation.

(a) **Terms Defined in Loan and Security Agreement**. All capitalized terms used in this Amendment (including in the recitals hereof) and not otherwise defined herein shall have the meanings assigned to them in the Loan and Security Agreement.

(b) **Interpretation**. The rules of interpretation set forth in Sections 1.3 and 1.4 of the Loan and Security Agreement shall be applicable to this Amendment and are incorporated herein by this reference.

SECTION 2 Amendments to the Loan and Security Agreement.

(a) The Loan and Security Agreement shall be amended as follows effective as of the Amendment Effective Date:

(i) Amended and Restated Definitions. The following definition under Section 1.1 is hereby amended and restated in its entirety as follows:

> "Performance Milestone I" means the achievement of both of the following: (i) the Borrower has publicly announced no later than [***] that the Phase 3 portion of the IMerge clinical trial of imetelstat in patients with lower risk myelodysplastic syndromes ("MDS") has completed full enrollment of One Hundred Seventy (170) patients, and (ii) Borrower has publicly announced that the planned Phase 3 Refractory MF clinical trial of imetelstat in patients with intermediate-2 or high-risk myelofibrosis ("MF") has been initiated with the first patient dosed, in each case, subject to reasonable verification by the Agent (including supporting documentation reasonably requested by the Agent)."

(ii) Subsections (a) and (b) of Section 7.20 is hereby amended and restated in its entirety as follows:

"(a) Inclusive of any Qualified Cash amounts maintained in accordance with Sections 7.20(b) and 7.20(c) from and after June 1, 2022, Borrower shall at all times maintain Qualified Cash in an amount of not less than $30,000,000; provided that, upon and after the FDA Approval Date, Borrower shall at all times maintain Qualified Cash in an amount of not less than $20,000,000.

(b) Inclusive of any Qualified Cash amounts maintained in accordance with Sections 7.20(a) and 7.20(c), from and after the date that Borrower first enters into a transaction described in clause (ii)(d)(z) of the definition of Permitted Licenses, Borrower shall at all times maintain Qualified Cash in an amount of not less than $35,000,000."

(c) **References Within Loan and Security Agreement**. Each reference in the Loan and Security Agreement to "this Agreement" and the words "hereof," "herein," "hereunder," or words of like import, shall mean and be a reference to the Loan and Security Agreement as amended by this Amendment.

SECTION 3 Conditions of Effectiveness. The effectiveness of Section 2 of this Amendment shall be subject to the satisfaction of each of the following conditions precedent:

(a) **This Amendment**. Agent shall have received this Amendment, executed by Agent, the Lenders and Borrower.

(b) **Representations and Warranties; No Default**. On the Amendment Effective Date, after giving effect to the amendment of the Loan and Security Agreement contemplated hereby:

(i) The representations and warranties contained in Section 5 shall be true and correct on and as of the Amendment Effective Date as though made on and as of such date, except to the extent such representations and warranties expressly relate to an earlier date, after giving effect in all cases to any standard(s) of materiality contained in the Agreement as to such representations and warranties; and

(ii) There exist no Events of Default or events that with the passage of time would result in an Event of Default.

SECTION 4 Representations and Warranties. To induce Agent and Lender to enter into this Amendment, Borrower hereby confirms, as of the date hereof, (a) that the representations and warranties made by it in Section 5 of the Loan and Security Agreement and in the other Loan Documents are true and correct in all material respects; *provided*, *however*, that such materiality qualifier shall not be applicable to any representations and warranties that already are qualified or modified by materiality in the text thereof; (b) that there has not been and there does not exist a Material Adverse Effect; and (c) that the information included in the Perfection Certificate delivered to Agent on the Amendment Effective Date is true and correct in all material respects. For the purposes of this Section 4, (i) each reference in Section 5 of the Loan and Security Agreement to "this Agreement," and the words "hereof," "herein," "hereunder," or words of like import in such Section, shall mean and be a reference to the Loan and Security Agreement as amended by this Amendment, and (ii) any representations and warranties which relate solely to an earlier date shall not be deemed confirmed and restated as of the date hereof (provided that such representations and warranties shall be true, correct and complete as of such earlier date).

SECTION 5 Miscellaneous.

(a) **Loan Documents Otherwise Not Affected; Reaffirmation**. Except as expressly amended pursuant hereto or referenced herein, the Loan and Security Agreement and the other Loan Documents shall remain unchanged and in full force and effect and are hereby ratified and confirmed in all respects. The Lenders' and Agent's execution and delivery of, or acceptance of, this Amendment shall not be deemed to create a course of dealing or otherwise create any express or implied duty by any of them to provide any other or further amendments, consents or

waivers in the future. Borrower hereby reaffirms the grant of security under Section 3.1 of the Loan and Security Agreement, subject to the provisions set forth in Section 3.2 of the Loan and Security Agreement, and hereby reaffirms that such grant of security in the Collateral secures all Secured Obligations under the Loan and Security Agreement and the other Loan Documents.

(b) **Conditions**. For purposes of determining compliance with the conditions specified in Section 3, each Lender that has signed this Amendment shall be deemed to have consented to, approved or accepted or to be satisfied with, each document or other matter required thereunder to be consented to or approved by or acceptable or satisfactory to a Lender unless Agent shall have received notice from such Lender prior to the Amendment Effective Date specifying its objection thereto.

(c) **Release**. Borrower hereby fully, finally and forever acquits, quitclaims, releases and discharges Agent and Lenders and their respective officers, directors, employees, agents, successors and assigns of and from any and all obligations, claims, liabilities, damages, demands, debts, liens, deficiencies or cause or causes of action to, of or for the benefit (whether directly or indirectly) of Borrower, at law or in equity, known or unknown, contingent or otherwise, whether asserted or unasserted, whether now known or hereafter discovered, whether statutory, in contract or in tort, as well as any other kind or character of action now held, owned or possessed (whether directly or indirectly) by Borrower on account of, arising out of, related to or concerning, whether directly or indirectly, proximately or remotely (i) the negotiation, review, preparation or documentation of the Loan Documents or any other documents or agreements executed in connection therewith, (ii) the administration of the Loan Documents, (iii) the enforcement, protection or preservation of Agent's and Lenders' rights under the Loan Documents, or any other documents or agreements executed in connection therewith, (iv) the negotiation, review, preparation and documentation of this Amendment or any other documents or agreements executed in connection herewith, and/or (v) any action or inaction by Agent or Lender in connection with any such documents, instruments and agreements.

Borrower acknowledges having read and understood and hereby waives the benefits of Section 1542 of the California Civil Code, which provides as follows (and hereby waives the benefits of any similar law of the state that may be applicable):

> "A general release does not extend to claims that the creditor or releasing party does not know or suspect to exist in his or her favor at the time of executing the release and that, if known by him or her, would have materially affected his or her settlement with the debtor or released party."

Borrower acknowledges that the foregoing provisions of this Section 5(c) are intended to be a general release with respect to the matters described therein. Borrower does hereby expressly acknowledge and agree that the waivers and releases contained in this Amendment shall not be construed as an admission of and/or the existence of any claims of Borrower against Agent or Lender. Borrower does hereby acknowledge and agree that the value to Borrower of this Amendment and of the covenants and agreements on the part of Lender contained in this Amendment substantially and materially exceeds any and all value of any kind or nature whatsoever of any claims or liabilities waived or released by Borrower hereunder.

(d) **No Reliance**. Each Borrower hereby acknowledges and confirms to Agent and the Lender that such Borrower is executing this Amendment on the basis of its own investigation and for its own reasons without reliance upon any agreement, representation, understanding or communication by or on behalf of any other Person.

(e) **Costs and Expenses**. Each Borrower agrees to pay to Agent on the Amendment Effective Date the out-of-pocket costs and expenses of Agent and the Lenders party hereto, and the fees and disbursements of counsel to Agent and the Lenders party hereto (including allocated costs of internal counsel), in connection with the negotiation, preparation, execution and delivery of this Amendment and any other documents to be delivered in connection herewith on the Amendment Effective Date or after such date.

(f) **Binding Effect**. This Amendment binds and is for the benefit of the successors and permitted assigns of each party.

(g) **Governing Law.** This Amendment and the other Loan Documents shall be governed by, and construed and enforced in accordance with, the laws of the State of California, excluding conflict of laws principles that would cause the application of laws of any other jurisdiction.

(h) **Complete Agreement; Amendments**. This Amendment and the Loan Documents represent the entire agreement about this subject matter and supersede prior negotiations or agreements with respect to such subject matter. All prior agreements, understandings, representations, warranties, and negotiations between the parties about the subject matter of this Amendment and the Loan Documents merge into this Amendment and the Loan Documents.

(i) **Severability of Provisions.** Each provision of this Amendment is severable from every other provision in determining the enforceability of any provision.

(j) **Counterparts**. This Amendment may be executed in any number of counterparts and by different parties on separate counterparts, each of which, when executed and delivered, is an original, and all taken together, constitute one Amendment. Delivery of an executed counterpart of a signature page of this Amendment by facsimile, portable document format (.pdf) or other electronic transmission will be as effective as delivery of a manually executed counterpart hereof.

(k) **Loan Documents**. This Amendment shall constitute a Loan Document.

[Balance of Page Intentionally Left Blank; Signature Pages Follow]

IN WITNESS WHEREOF, the parties hereto have duly executed this Amendment, as of the date first above written.

BORROWER:

GERON CORPORATION

Signature: /s/ Olivia Bloom

Print Name: Olivia K. Bloom

Title: Chief Financial Officer

AGENT:

HERCULES CAPITAL, INC.

Signature: /s/ Zhuo Huang

Print Name: Zhuo Huang

Title: Associate General Counsel

LENDER:

HERCULES CAPITAL, INC.

Signature: /s/ Zhuo Huang

Print Name: Zhuo Huang

Title: Associate General Counsel

LENDER:

SILICON VALLEY BANK

Signature: /s/ Peter Sletteland

Print Name: Peter Sletteland

Title: Vice President

EXHIBIT 10.3

GERON CORPORATION

2018 INDUCEMENT AWARD PLAN

ADOPTED BY THE BOARD OF DIRECTORS: DECEMBER 14, 2018
(WITH 3,000,000 SHARE RESERVE)
AMENDED AND RESTATED: JANUARY 29, 2019 (ADDED 5,000,000 SHARES)
AMENDED AND RESTATED: FEBRUARY 11, 2020 (ADDED 1,300,000 SHARES)
AMENDED AND RESTATED: FEBRUARY 1, 2021 (ADDED 800,000 SHARES)
AMENDED AND RESTATED: MAY 11, 2021 (ADDED 5,000,000 SHARES)

1. GENERAL.

(a) Eligible Award Recipients. Awards may only be granted to Employees who satisfy the standards for inducement grants under Rule 5635(c)(4) of the Nasdaq Listing Rules. A person who previously served as an Employee or Director will not be eligible to receive Awards, other than following a bona fide period of non-employment.

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

(c) Purpose. The Plan, through the granting of Stock Awards, is intended to 1) help the Company and any Affiliate secure and retain the services of eligible Stock Award recipients, 2) provide an inducement material for such persons to enter into employment with the Company or an Affiliate within the meaning of Rule 5635(c)(4) of the Nasdaq Listing Rules, 3) provide incentives for such persons to exert maximum efforts for the success of the Company and any Affiliate and 4) 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

2. 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). However, notwithstanding the foregoing or anything in the Plan to the contrary, the grant of Stock Awards will be approved by the Company's independent compensation committee or a majority of the Company's independent directors (as defined in Rule 5605(a)(2) of the Nasdaq Listing Rules) in order to comply with the exemption from the stockholder approval requirement for "inducement grants" provided under Rule 5635(c)(4) of the Nasdaq Listing Rules.

(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 certain nonqualified deferred compensation under Section 409A of the Code and/or to make the Plan or Stock Awards granted under the Plan 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. 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 (to the extent the Board determines advisable or to the extent required pursuant to applicable laws or listing requirements), including, but not limited to, amendments to the Plan to comply with other applicable laws or listing requirements, provided, however, that any amendment provided in Section 9(a) relating to Capitalization Adjustments shall not require stockholder approval.

(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 and applicable laws or listing requirements, including Rule 5635(c) of the Nasdaq Listing Rules; *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 clarify the manner of exemption from, or to bring the Stock Award into compliance with, Section 409A of the Code; or (B) 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 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. 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. However,

notwithstanding the foregoing or anything in the Plan to the contrary, the grant of Stock Awards will be approved by the Company's independent compensation committee or a majority of the Company's independent directors (as defined in Rule 5605(a)(2) of the Nasdaq Listing Rules) in order to comply with the exemption from the stockholder approval requirement for "inducement grants" provided under Rule 5635(c)(4) of the Nasdaq Listing Rules.

(d) 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.

(e) 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.

(f) 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.

3. 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 15,100,000 shares (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.

(b) Reversion of Shares to the Share Reserve. If a Stock Award or any portion thereof (i) expires or otherwise terminates without all of the shares covered by such Stock Award having been issued or (ii) is settled in cash (*i.e.*, the Participant receives cash rather than stock), such expiration, termination or settlement will not reduce (or otherwise offset) the number of shares of Common Stock that may be available for issuance under the Plan. If any shares of Common Stock issued pursuant to a Stock Award are forfeited back to or repurchased or reacquired by the Company for any reason, including because of the failure to meet a contingency or condition required to vest such shares in the Participant, then the shares that are forfeited or repurchased or reacquired will revert to and again become available for issuance under the Plan. Any shares reacquired or withheld by the Company in satisfaction of tax withholding obligations on a Stock Award or as consideration for the exercise or purchase price of a Stock Award (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")) will again become available for issuance under the Plan.

(c) 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.

4. ELIGIBILITY.

(a) Eligibility for Stock Awards. Stock Awards may be granted only to persons who are Employees described in Section 1(a), where the Stock Award is an inducement material to the individual's entering into employment with the Company or an Affiliate within the meaning of Rule 5635(c)(4) of the Nasdaq Listing Rules. For clarity, Stock Awards may not be granted to (1) Directors, for service in such capacity, or (2) any individual who was previously an Employee or Director, other than following a bona fide period of non-employment. Notwithstanding the foregoing, Stock Awards may not be granted to Employees 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) Approval Requirements. All Stock Awards must be granted either by a majority of the Company's independent directors or by the Company's compensation committee comprised of independent directors within the meaning of Rule 5605(a)(2) of the Nasdaq Listing Rules.

5. 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 Nonstatutory Stock Options. 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. 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. 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. 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) 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).

(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.

6. 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 or (B) 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) 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(f)), 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.

7. 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.

8. 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 or (ii) as may be applicable after the grant of a Stock Award should the Employee recipient's service capacity change to that of a Consultant or Director, (1) the service of a Consultant pursuant to the terms of such Consultant's agreement with the Company or an Affiliate, or (2) 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) 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 he or she is 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.

(g) 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.

(h) 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).

(i) 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.

(j) 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.

(k) 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.

9. 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) and (ii) 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.

10. Termination or Suspension of the Plan.

(a) The Board may suspend or terminate the Plan at any time. 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.

11. Effective Date of Plan.

This Plan will become effective on the Effective Date.

12. 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.

13. Definitions. As used in the Plan, the following definitions will apply to the capitalized terms indicated below:

(a) "***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.

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

(c) "***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.

(d) "***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.

(e) "***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 twenty-four 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. Consultants are not eligible to be granted Stock Awards under this Plan with respect to their service in such capacity.

(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. Directors are not eligible to be granted Stock Awards with respect to their service in such capacity under this Plan.

(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 December 14, 2018, the date the Plan was approved by the Board.

(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) "***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.

(u) "***Nonstatutory Stock Option***" means any option granted pursuant to Section 5 that does not qualify as an "incentive stock option" within the meaning of Section 422 of the Code.

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

(w) "***Option***" means a Nonstatutory Stock Option to purchase shares of Common Stock granted pursuant to the Plan.

(x) "***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.

(y) "***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.

(z) "***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(c).

(aa) "***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.

(bb) "***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.

(cc) "***Plan***" means this Geron Corporation 2018 Inducement Award Plan.

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

(ee) "***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.

(ff) "***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).

(gg) "***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.

(hh) "***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.

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

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

(kk) "***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.

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

(mm) "***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.

(nn) "***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%.

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 quarterly report on Form 10-Q 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: August 16, 2021

/s/ JOHN A. SCARLETT
JOHN A. SCARLETT, M.D.
President and Chief Executive Officer

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 Bloom, certify that:

1. I have reviewed this quarterly report on Form 10-Q 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: August 16, 2021

/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 quarterly report on Form 10-Q of the Company for the quarter ended June 30, 2021 (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: August 16, 2021

/s/ JOHN A. SCARLETT
JOHN A. SCARLETT, M.D.
President and Chief Executive Officer

This certification accompanies the Form 10-Q 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-Q), 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 quarterly report on Form 10-Q of the Company for the quarter ended June 30, 2021 (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: August 16, 2021

/s/ OLIVIA BLOOM

OLIVIA K. BLOOM

Executive Vice President, Finance, Chief Financial Officer and Treasurer

This certification accompanies the Form 10-Q 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-Q), irrespective of any general incorporation language contained in such filing.