DRIVEN BY OUR VALUES

PATIENTS ARE OUR NORTH

WE > ME



SCIENCE IS IN OUR SOUL

MAKE IT HAPPEN

Cytokinetics

ANNUAL REPORT 2022



DEAR SHAREHOLDER,

Core values define how businesses operate, behave, and show up on a daily basis. In other words, how we do what we do is just as important as what we do every day. At Cytokinetics, we are dedicated to our mission of bringing forward new medicines for patients, but the principles that define our business and guide our individual actions are the values we live by. In 2022, we refined our core values to clarify and distill them into four key tenets: Patients are our North Star, Science is in our Soul, We > Me and Make It Happen. These values reflect how patients are at the center of all we do, our commitment to critical scientific thinking and integrity, our pledge to foster diversity, equity and belonging while always being our best selves, and our signature tenacity, resilience and results orientation. Our values define who we are as a company, what we expect from one another, and what is important to us. In 2022, our values continued to ground and inspire us, helped steer progress we made against goals, and enabled our achievements and corporate development.

Foremost amongst our progress last year was the expansion of the development program for *aficamten*, our next-in-class cardiac myosin inhibitor, for the potential treatment of hypertrophic cardiomyopathy (HCM). We began patient enrollment in SEQUOIA-HCM, the pivotal Phase 3 clinical trial in patients with symptomatic obstructive HCM, and started Cohort 4 of REDWOOD-HCM in patients with non-obstructive HCM. These milestones represent an important step forward for this program, which is poised to expand further in 2023 with two additional Phase 3 clinical trials planned. *Aficamten* is both a potentially promising new medicine for patients with HCM arising from pioneering research in our labs, and an important value driver for our company and shareholders as it is expected to deliver meaningfully in this year.

In parallel, our company evolved significantly over the past year in preparation for the future commercialization of our medicines. We built up our capabilities and commercial readiness for our specialty cardiovascular franchise inclusive of *omecamtiv mecarbil*, our investigational cardiac myosin activator, as well as *aficamten*. In 2022, the U.S. Food & Drug Administration (FDA) Cardiovascular and Renal Drugs Advisory Committee (CRDAC) voted 8 to 3 that the benefits of *omecamtiv mecarbil* do not outweigh its risks for the treatment of heart failure with reduced ejection fraction (HFrEF) and, in early 2023, we received a Complete Response Letter regarding our New Drug Application for *omecamtiv mecarbil*. While we are disappointed with this outcome, this was a scenario for which we had prepared. We are pursuing international approvals for *omecamtiv mecarbil* as we assess the future of the program in the U.S. The commercial infrastructure that we have built was designed to support our specialty cardiovascular franchise strategy with strong synergies between *omecamtiv mecarbil*, *aficamten* and additional cardiovascular drug candidates arising from our pipeline. While we continue to believe in the science underlying *omecamtiv mecarbil* and its demonstrated clinical evidence to potentially benefit patients with worsening heart failure, in 2023 we are confidently pivoting our focus to *aficamten* in the U.S., building on the tremendous work completed last year that serves our strategic objectives going forward and is consistent with our mission.

Additionally in 2022, as we continued conduct of COURAGE-ALS, the Phase 3 clinical trial of *reldesemtiv*, our investigational fast skeletal muscle troponin activator in patients with amyotrophic lateral sclerosis (ALS), we also began COURAGE-ALS OLE, an open-label extension study for patients completing COURAGE-ALS. In March 2023, the Data Monitoring Committee for COURAGE-ALS conducted the second planned interim analysis, and after reviewing unblinded data from the clinical trial, recommended the discontinuation of the clinical trial due to futility. Cytokinetics has been committed to the ALS community for more than a decade and this was an extremely disappointing outcome. We also know that pioneering science does not always result in success and this setback only reinforces our dedication to bring forward innovative therapies to patients suffering from diseases of impaired muscle function.

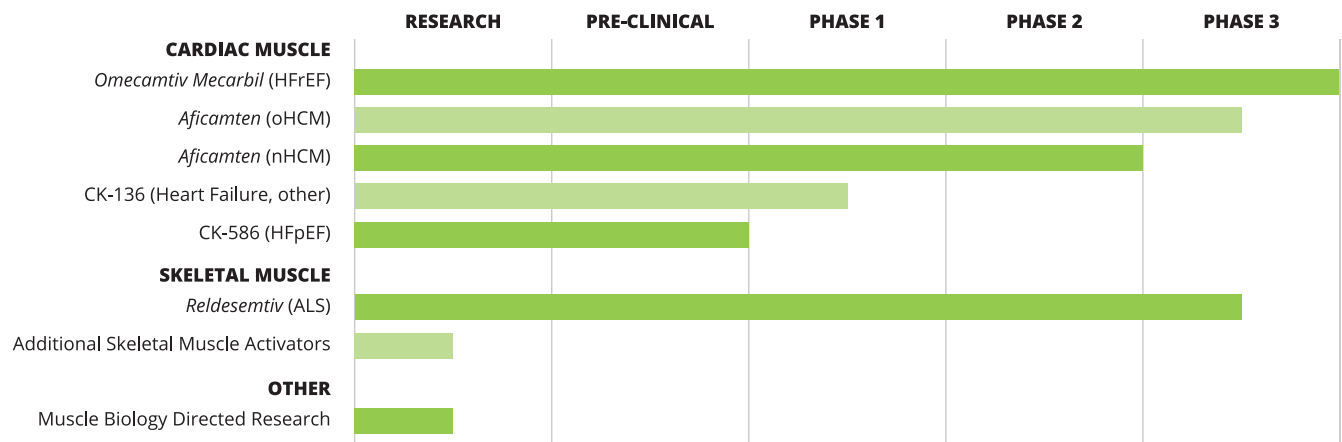
In 2023, we are celebrating 25 years since our start of operations and while so much has changed for Cytokinetics over the years, our patient centricity, integrity, critical thinking and resilience remain as strong as ever. Our operations now span both coasts following the opening of an additional office outside of Philadelphia in 2022, and our more than 400-employee strong organization now supports our vision of being an integrated commercial-ready biopharmaceutical company with a robust and innovative pipeline arising from our research.

As we enter 2023, we remain on strong financial standing, with over two years of forward cash runway, five programs in clinical development and more programs emerging from our research, as well as many key milestones expected this year, including the readout of SEQUOIA-HCM. We look to the future with confidence and renewed conviction, and will keep you apprised of our progress.

Thank you, as always, for your support.



Robert I. Blum
President and Chief Executive Officer



All drug candidates above are investigational products and are not approved as safe or effective for any indication.

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

Form 10-K

(Mark One)

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

For the fiscal year ended December 31, 2022

or

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

From the transition period from __ to

Commission file number: 000-50633

CYTOKINETICS, INCORPORATED

(Exact name of registrant as specified in its charter)

Delaware	**94-3291317**
(State or other jurisdiction of incorporation or organization)	*(I.R.S. Employer Identification No.)*
350 Oyster Point Boulevard South San Francisco, CA	**94080**
(Address of principal executive offices)	*(Zip Code)*

(650) 624-3000

(Registrant's telephone number, including area code)

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

Title of each class	Trading symbol	Name of each exchange on which registered
Common Stock, $0.001 par value	**CYTK**	**The Nasdaq Global Select Market**

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

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

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

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

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

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or 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 has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C.7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☑

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

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

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

The approximate aggregate market value of voting and non-voting stock held by non-affiliates of the registrant was $2.0 billion as of June 30, 2022.(A)

(A) Excludes 34.8 million shares of common stock held by directors and executive officers, and any stockholders whose ownership exceeds ten percent of the shares outstanding, at June 30, 2022. Exclusion of shares held by any person should not be construed to indicate that such person possesses the power, directly or indirectly, to direct or cause the direction of the management or policies of the registrant, or that such person is controlled by or under common control with the registrant.

As of February 27, 2023, the number of shares outstanding of the Registrant's common stock, par value $0.001 per share, was 95,161,391 shares.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Registrant's Proxy Statement for its 2023 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission, no later than 120 days after the end of the fiscal year, are incorporated by reference into Part III of this Annual Report on Form 10-K.

CYTOKINETICS, INCORPORATED

FORM 10-K

YEAR ENDED DECEMBER 31, 2022

INDEX

		Page
	Glossary of Terms	3
	Forward Looking Statements Private Securities Litigation Reform Act of 1995	6
	Summary of Principal Risk Factors	8
	PART I	
Item 1.	Business	10
Item 1A.	Risk Factors	31
Item 1B.	Unresolved Staff Comments	60
Item 2.	Properties	61
Item 3.	Legal Proceedings	61
Item 4.	Mine Safety Disclosures	61
	PART II	
Item 5.	Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities	62
Item 6.	[Reserved]	63
Item 7.	Management's Discussion and Analysis of Financial Condition and Results of Operations	64
Item 7A.	Quantitative and Qualitative Disclosures About Market Risk	73
Item 8.	Financial Statements and Supplementary Data	75
Item 9.	Changes in and Disagreements with Accountants on Accounting and Financial Disclosure	110
Item 9A.	Controls and Procedures	110
Item 9B.	Other Information	112
Item 9C.	Disclosure Regarding Foreign Jurisdictions that Prevent Inspections	112
	PART III	
Item 10.	Directors, Executive Officers and Corporate Governance	113
Item 11.	Executive Compensation	113
Item 12.	Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters	113
Item 13.	Certain Relationships and Related Transactions, and Director Independence	113
Item 14.	Principal Accountant Fees and Services	113
	PART IV	
Item 15.	Exhibits and Financial Statement Schedules	114
Exhibits		114
Item 16.	Form 10-K Summary	118
Signatures		119

GLOSSARY OF TERMS

Unless the context requires otherwise, references to "Cytokinetics," "the Company," "we," "us" or "our" in this Form 10-K (defined below) refer to Cytokinetics, Incorporated and its subsidiaries. References to "Notes" in this Form 10-K are to the Notes to the Consolidated Financial Statements in this Form 10-K. We also have used other specific terms in this Form 10-K, most of which are explained or defined below:

Term/Abbreviation	Definition
2004 Plan	Cytokinetics' Amended and Restated 2004 Equity Incentive Plan
2020 RTW Transactions	The transactions contemplated by the RTW Royalty Purchase Agreement, Ji Xing Aficamten License Agreement and the Common Stock Purchase Agreements, dated July 14, 2020, by and between Cytokinetics and the RTW Investors.
2021 RTW Transactions	The transactions contemplated by the Ji Xing OM License Agreement and the Common Stock Purchase Agreements, dated December 20, 2021 by and between Cytokinetics and the RTW Investors
2022 RPI Transactions	The transactions contemplated by the RP Loan Agreement and the RP Aficamten RPA
2026 Notes	Cytokinetics' 4% convertible senior notes due 2026
2027 Indenture	Indenture Agreement, dated July 6, 2022, between Cytokinetics and U.S. Bank Trust Company, as trustee
2027 Notes	Cytokinetics' 3.50% convertible senior notes due 2027
ACA	Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act
ACC	American College of Cardiology
AHA	American Heart Association
ALS	amyotrophic lateral sclerosis (also known as Lou Gehrig's Disease)
ALSFRS-R	ALS Functional Rating Scale – Revised
Amgen Agreement	Collaboration and Option Agreement, dated December 29, 2006, as amended, between Cytokinetics and Amgen
ARR	absolute risk reductions
Astellas Agreement	License and Collaboration Agreement, dated June 21, 2013, between Cytokinetics and Astellas
Astellas FSRA Agreement	Fast Skeletal Regulatory Activator Agreement, dated April 23, 2020 between Cytokinetics and Astellas
Astellas OSSA Agreement	License and Collaboration Agreement for Other Skeletal Sarcomere Activators, dated April 23, 2020, as amended, between Cytokinetics and Astellas
ASU 2020-06	ASU 2020-06, Debt-Debt with Conversion and Other Options (Subtopic 470-20) and Derivatives and Hedging-Contracts in Entity's Own Equity (Subtopic 815-40): Accounting for Convertible Instruments and Contracts in an Entity's Own Equity
BTR/W	background therapy reduction/withdrawal
cGMP	current Good Manufacturing Practice
China	People's Republic of China (including the Hong Kong and Macau SARs)
CMC	Chemistry, Manufacturing and Controls
CMO	Contract Manufacturing Organizations
Compensation Committee	Compensation and Talent Committee of Cytokinetics' Board of Directors
Convertible Notes	2026 Notes and 2027 Notes
COURAGE-ALS	Clinical Outcomes Using Reldesemtiv on ALSFRS-R in a Global Evaluation in ALS
CPET	cardiopulmonary exercise testing
CRL	Complete Response Letter
CRO	Contract Research Organization
CV	cardiovascular
DMC	Data Monitoring Committee
E.U. or EU	European Union
EEA	European Economic Area
eGFR	estimated glomerular filtration rate
EMA	European Medicines Agency
ESPP	employee stock purchase plan
Exchange Act	Securities Exchange Act of 1934, as amended
FDA	U.S. Food and Drug Administration
Final Payment Amount	As defined in Part II, Item 7 (Management's Discussion and Analysis of Financial Conditions and Results of Operations) of this Annual Report on Form 10-K – Sources and Uses of Cash, 2022 Royalty Pharma Transactions

FOREST-HCM	Five-Year, Open-Label, Research Evaluation of Sustained Treatment with Aficamten in HCM
FORTITUDE-ALS	Functional Outcomes in a Randomized Trial of Investigational Treatment with CK-2127107 to Understand Decline in Endpoints – in ALS
FSRA	fast skeletal regulatory activator
FSTA	fast skeletal muscle troponin activator
Fundamental Change	As defined in the 2027 Indenture
Funding Agreement	As defined in Part II, Item 8 (Financial Statements and Supplementary Data), Notes to Consolidated Financial Statements of this Annual Report on Form 10-K - Note 3 (Research and Development Arrangements), Funding Agreement
GAAP	Generally Accepted Accounting Principles in the U.S.
GALACTIC-HF	Global Approach to Lowering Adverse Cardiac Outcomes Through Improving Contractility in Heart Failure
GCP	Good Clinical Practice
GDPR	General Data Protection Regulation ((EU) 2016/679)
HCM	hypertrophic cardiomyopathy
HFrEF	heart failure with reduced ejection fraction
HFSA	Heart Failure Society of America
HHS	U.S. Department of Health and Human Services
HIPAA	The federal Health Insurance Portability and Accountability Act of 1996, as amended by the Health Information Technology for Economic and Clinical Health Act
ICER	Institute for Clinical and Economic Review
IND	Investigational New Drug
IRA	Inflation Reduction Act of 2022
IRB	Institutional Review Board
Ji Xing	Ji Xing Pharmaceuticals Limited and/or its affiliates, including Ji Xing Pharmaceuticals Hong Kong Limited
Ji Xing Aficamten License Agreement	License and Collaboration Agreement, dated July 14, 2020, by and between Cytokinetics and Ji Xing Pharmaceuticals Limited
Ji Xing Agreements	Ji Xing Aficamten License Agreement and Ji Xing OM License Agreement
Ji Xing OM License Agreement	License and Collaboration Agreement, dated December 20, 2021, by and between Cytokinetics and Ji Xing Pharmaceuticals Limited
KCCQ	Kansas City Cardiomyopathy Questionnaire
KCCQ-OSS	KCCQ Overall Summary Score
Lenders	Silicon Valley Bank and Oxford Finance LLC
LSM	least square mean
LVEF	left ventricular ejection fraction
LVOT	left ventricular outflow tract
LVOT-G	left ventricular outflow tract gradient
MAA	Marketing Authorization Application
MAPLE-HCM	**M**etoprolol vs *Aficamten* in **P**atients with **L**VOT Obstruction on **E**xercise **E**ndpoints Capacity in **HCM**
Mavacamten Royalty	certain payments on the net sales of products containing the compound mavacamten pursuant to the Research Collaboration Agreement, dated August 24, 2012, between Cytokinetics and MyoKardia, Inc.
NDA	New Drug Application
nHCM	non-obstructive HCM
NOLs	net operating loss carryforward
NYHA	New York Heart Association
oHCM	obstructive HCM
OLE	Open-Label Extension
Ownership Change	As defined in Part 1, Item 1A (Risk Factors) of this Annual Report on Form 10-K, General Risks
Oxford	Oxford Finance LLC
Oyster Point Lease	Lease, dated July 24, 2019, by and between Cytokinetics and KR Oyster Point 1, LLC, as amended
Partial Redemption Limitation	As defined in the 2027 Indenture
PSU	Performance Stock Unit

Radnor Lease	As defined in Part II, Item 8 (Financial Statements and Supplementary Data), Notes to Consolidated Financial Statements of this Annual Report on Form 10-K - Note 9 (Commitments and Contingencies) – Operating Leases
REDWOOD-HCM	Randomized Evaluation of Dosing With CK-274 in Obstructive Outflow Disease in HCM
REDWOOD-HCM OLE	Randomized Evaluation of Dosing With CK-274 in Obstructive Outflow Disease in HCM Open Label Extension
REMS	Risk Evaluation and Mitigation Strategy
RP Aficamten Liability	As defined in Part II, Item 7 (Management's Discussion and Analysis of Financial Conditions and Results of Operations) of this Annual Report on Form 10-K – Results of Operations, Non-cash interest expense on liabilities related to revenue participation right purchase agreements
RP Aficamten RPA	Revenue Participation Right Purchase Agreement, dated January 7, 2022, by and between Cytokinetics and Royalty Pharma Investments 2019 ICAV
RP Loan Agreement	Development Funding Loan Agreement, dated January 7, 2022, by and among Royalty Pharma Development Funding, LLC and Cytokinetics
RP OM Liability	As defined in Part II, Item 8 (Financial Statements and Supplementary Data), Notes to Consolidated Financial Statements of this Annual Report on Form 10-K - Note 6 (Agreements with Royalty Pharma) – 2017 RP Omecamtiv Mecarbil Royalty Purchase Agreement
RP OM RPA	Royalty Purchase Agreement, dated February 1, 2017, by and between the Cytokinetics and RPI Finance Trust, as amended by Amendment No. 1, dated January 7, 2022
RPDF	Royalty Pharma Development Funding, LLC
RPFT	RPI Finance Trust
RPI ICAV	Royalty Pharma Investments 2019 ICAV
RSU	Restricted Stock Unit
RTW ICAV	RTW Investments ICAV for RTW Fund 1
RTW Investors	RTW Master Fund, Ltd., RTW Innovation Master Fund, Ltd. and RTW Venture Fund Limited
RTW Royalty Holdings	RTW Royalty Holdings Designated Activity Company
RTW Royalty Purchase Agreement	Royalty Purchase Agreement, dated July 14, 2020, between Cytokinetics and RTW Royalty Holdings
SAM	systolic anterior motion
Section 382	Section 382 of the Internal Revenue Code
Securities Act	Securities Act of 1933, as amended
SEQUOIA-HCM	Safety, Efficacy, and Quantitative Understanding of Obstruction Impact of Aficamten in HCM
SGLT2	sodium-glucose cotransporter-2
SMA	spinal muscular atrophy
SPA	Special Protocol Assessment
SVC	slow vital capacity
Tax Act	Tax Cuts and Jobs Act
Term Loan Agreement	Loan and Security Agreement, dated as of October 19, 2015, by and among Cytokinetics, Oxford Finance LLC and Silicon Valley Bank and Loan and Security Agreement, dated as of May 17, 2019, by and among Cytokinetics, Oxford Finance LLC and Silicon Valley Bank
U.S. or US	United States

This Form 10-K includes discussion of certain clinical studies relating to various in-line products and/or product candidates. These studies typically are part of a larger body of clinical data relating to such products or product candidates, and the discussion herein should be considered in the context of the larger body of data. In addition, clinical trial data are subject to differing interpretations, and, even when we view data as sufficient to support the safety and/or effectiveness of a product candidate or a new indication for an in-line product, regulatory authorities may not share our views and may require additional data or may deny approval altogether.

CYTOKINETICS and our C-shaped logo are registered trademarks of Cytokinetics in the U.S. and certain other countries. Other service marks, trademarks and trade names referred to in this report are the property of their respective owners.

The information contained on our website, our Facebook, Instagram, YouTube and LinkedIn pages or our Twitter accounts, or any third-party website, is not incorporated by reference into this Form 10-K.

FORWARD LOOKING STATEMENTS
PRIVATE SECURITIES LITIGATION REFORM ACT OF 1995

This report contains forward-looking statements indicating expectations about future performance and other forward-looking statements within the meaning of Section 27A of the Securities Act, Section 21E of the Exchange Act, and the Private Securities Litigation Reform Act of 1995, that involve risks and uncertainties. We intend that such statements be protected by the safe harbor created thereby. Forward-looking statements involve risks and uncertainties and our actual results and the timing of events may differ significantly from the results discussed in the forward-looking statements. Examples of such forward-looking statements include, but are not limited to, statements about or relating to:

- the initiation, design, conduct, enrollment, progress, timing and scope of clinical trials and development activities for our drug candidates conducted by ourselves or our partners, including the anticipated timing for completion and announcement of results of our clinical trials, including SEQUOIA-HCM, and COURAGE-ALS, anticipated rates of enrollment for clinical trials and anticipated timing of results becoming available or being announced from clinical trials;
- guidance concerning revenues and net cash use for 2023;
- the sufficiency of existing resources to fund our operations for at least the next 12 months;
- our capital requirements and needs for additional financing;
- our expectations as to our cash utilization for 2023 and in any subsequent period;
- the results from the clinical trials, the non-clinical studies and chemistry, manufacturing, and controls activities of our drug candidates and other compounds, and the significance and utility of such results; anticipated interactions with regulatory authorities;
- our ability to ensure commercial availability of an antibody-based immunoassay for the dose optimization of omecamtiv mecarbil;
- our and our partners' plans or ability to conduct the continued research and development of our drug candidates and other compounds;
- the timing and likelihood of regulatory approval for any of our other drug candidates;
- our expected roles in research, development or commercialization under our strategic alliances with our partners and collaborators;
- the properties and potential benefits of, and the potential market opportunities for, our drug candidates and other compounds, including the potential indications for which they may be developed;
- the sufficiency of the clinical trials conducted with our drug candidates to demonstrate that they are safe and efficacious;
- our receipt of milestone payments, royalties, reimbursements and other funds from current or future partners under strategic alliances;
- our ability to continue to identify additional potential drug candidates that may be suitable for clinical development;
- market acceptance of our drugs;
- changes in third party healthcare coverage and reimbursement policies;
- our plans or ability to commercialize drugs, with or without a partner, including our intention to develop sales and marketing capabilities;
- the focus, scope and size of our research and development activities and programs;
- the utility of our focus on the biology of muscle function, and our ability to leverage our experience in muscle contractility to other muscle functions;
- our ability to protect our intellectual property and to avoid infringing the intellectual property rights of others;
- future payments and other obligations under loan, lease, and revenue interest agreements and the Convertible Notes;
- potential competitors and competitive products;
- retaining key personnel and recruiting additional key personnel;

- the potential impact of recent accounting pronouncements on our financial position or results of operations; and
- the continuing impact of the COVID-19 pandemic on our research and development activities and business operations.

Such forward-looking statements involve risks and uncertainties, including, but not limited to:

- decisions by Ji Xing with respect to the timing, design and conduct of development and commercialization activities for aficamten or omecamtiv mecarbil in China and Taiwan;
- our ability to meet any of the conditions for disbursement and our receipt of any loan disbursements under the RP Loan Agreement;
- our ability to meet any of the conditions for disbursement of additional sale proceeds under the RP Aficamten RPA;
- our ability to enroll patients in our clinical trials by any particular date;
- our ability to complete our clinical trials by any particular date;
- our ability to enter into strategic partnership agreements for any of our programs on acceptable terms and conditions or in accordance with our planned timelines;
- our ability to obtain additional financing on acceptable terms, if at all;
- our receipt of funds and access to other resources under our current or future strategic alliances, in the development, testing, manufacturing or commercialization of our drug candidates or slower than anticipated patient enrollment, in our or partners' clinical trials, or in the manufacture and supply of clinical trial materials;
- failure by our contract research organizations, contract manufacturing organizations and other vendors to properly fulfill their obligations or otherwise perform as expected;
- results from non-clinical studies that may adversely impact the timing or the further development of our drug candidates and other compounds;
- the possibility the FDA or foreign regulatory agencies may delay or limit our or our partners' ability to conduct clinical trials or may delay or withhold approvals for the manufacture and sale of our drug candidates;
- changing standards of care and the introduction of products by competitors or alternative therapies for the treatment of indications we target that may limit the commercial potential of our drug candidates;
- difficulties or delays in achieving market access, reimbursement and favorable drug pricing for our drug candidates and the potential impacts of health care reform;
- changes in laws and regulations applicable to drug development, commercialization or reimbursement;
- the uncertainty of protection for our intellectual property, whether in the form of patents, trade secrets or otherwise;
- potential infringement or misuse by us of the intellectual property rights of third parties;
- activities and decisions of, and market conditions affecting, current and future strategic partners;
- accrual information provided by and performance of our contract research organizations, contract manufacturing organizations, and other vendors;
- potential ownership changes under Internal Revenue Code Section 382; and
- the timeliness and accuracy of information filed with the U.S. Securities and Exchange Commission by third parties.

In addition, such statements are subject to the risks and uncertainties discussed in the "Risk Factors" section and elsewhere in this document. Such statements speak only as of the date on which they are made, and, except as required by law, we undertake no obligation to update any forward-looking statement to reflect events or circumstances after the date on which the statement is made or to reflect the occurrence of unanticipated events. New factors emerge from time to time, and it is not possible for us to predict which factors will arise. In addition, we cannot assess the impact of each factor on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements.

In addition, statements that "we believe" and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date of this Annual Report on Form 10-K, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain and investors are cautioned not to unduly rely upon these statements.

SUMMARY OF PRINCIPAL RISK FACTORS

Risks Specific to our Research and Development Activities

- We recently received a CRL from FDA in response to our NDA for omecamtiv mecarbil. The CRL stated that results from an additional clinical trial of omecamtiv mecarbil are required to establish substantial evidence of effectiveness for the treatment of HFrEF, with benefits that outweigh the risks. No assurance can be given that we will be able to address any of the deficiencies noted in the CRL and/or obtain FDA approval of our NDA for omecamtiv mecarbil.
- Clinical trials may fail to demonstrate the desired safety and efficacy of our drug candidates, including aficamten and reldesemtiv, which could prevent or significantly delay completion of clinical development and regulatory approval.
- The regulatory approval process is expensive, time-consuming and uncertain and may prevent our partners or us from obtaining approvals to commercialize some or all of our drug candidates.
- Our clinical trials are expensive, time-consuming and may be subject to delay.
- If we encounter difficulties enrolling patients in our clinical trials, including COURAGE-ALS and SEQUOIA-HCM, our clinical development activities could be delayed or otherwise adversely affected.
- The COVID-19 pandemic continues to adversely impact our business and could materially and adversely affect our operations, as well as the businesses or operations of our or our partners, manufacturers, CROs or other third parties with whom we or our partners conduct business.
- The failure to successfully develop, validate and obtain regulatory clearance or approval of an antibody based immunoassay for plasma concentrations of omecamtiv mecarbil could harm our development and commercialization strategy for omecamtiv mecarbil in the United States.
- The failure to successfully develop, validate and obtain regulatory clearance or approval of an antibody based immunoassay for plasma concentrations of omecamtiv mecarbil could be required by EMA for approval of our MAA in the E.U. and as a result could delay our development and commercialization strategy for omecamtiv mecarbil in the E.U. and other countries of the EEA.
- We depend on CROs to conduct our clinical trials and have limited control over their performance. If these CROs do not successfully carry out their contractual duties or meet expected deadlines, or if we lose any of our CROs, we may not be able to obtain regulatory approval for or commercialize our product candidates on a timely basis, if at all.

Risks Specific to our Commercial Operations

- Our competitors may develop drugs that are less expensive, safer and/or more effective than ours, which may diminish or eliminate the commercial success of any drugs that we may commercialize.
- Even if our drug candidates are approved, we may experience difficulties or delays in achieving market access, reimbursement and favorable drug pricing for our drug products.
- The commercial success of our products depends on the availability and sufficiency of third party payor coverage and reimbursement.
- We have no manufacturing capacity and depend on contract manufacturers to produce our clinical trial materials, including our drug candidates, and will have continued reliance on contract manufacturers for the development and commercialization of our potential drugs.
- We may not be able to successfully manufacture our drug candidates in sufficient quality and quantity, which would delay or prevent us from developing our drug candidates and commercializing resulting approved drugs, if any.
- If we or our partners receive regulatory approval for our drug candidates, we or they will be subject to ongoing obligations to and continued regulatory review by the FDA and foreign regulatory agencies, and may be subject to additional post-marketing obligations, all of which may result in significant expense and limit commercialization of our potential drugs.
- If physicians and patients do not accept our drugs, we may be unable to generate significant revenue, if any.

Risks Specific to our Intellectual Property

- Our success depends substantially upon our ability to obtain and maintain intellectual property protection relating to our drug candidates, compounds and research technologies.
- If we are unable to protect the confidentiality of our trade secrets, the value of our technology could be materially adversely affected and our business would be harmed.
- If we are sued for infringing third-party intellectual property rights, it will be costly and time-consuming, and an unfavorable outcome could have a significant adverse effect on our business.
- We may undertake infringement or other legal proceedings against third parties, causing us to spend substantial resources on litigation and exposing our own intellectual property portfolio to challenge.
- We may become involved in disputes with our strategic partners over intellectual property ownership, and publications by our research collaborators and clinical investigators could impair our ability to obtain patent protection or protect our proprietary information, either of which would have a significant impact on our business.
- We may be subject to claims that our employees, consultants or independent contractors have wrongfully used or disclosed confidential information of third parties or that we or our employees have wrongfully used or disclosed trade secrets of their former employers.

Financial Risks

- We have a history of significant losses and may not achieve or sustain profitability and, as a result, you may lose part or all of your investment.
- We will need substantial additional capital in the future to sufficiently fund our operations.
- We have never generated, and may never generate, revenues from commercial sales of our drugs, and we may not have drugs to market for at least several years, if ever.
- We may not be entitled to obtain additional loan disbursements under the RP Loan Agreement or the RP Aficamten RPA.
- Our indebtedness and liabilities could limit the cash flow available for our operations, expose us to risks that could adversely affect our business, financial condition and results of operations and impair our ability to satisfy our obligations under the 2026 Notes, the 2027 Notes and the RP Loan Agreement.

Legal and Compliance Risks

- Recently enacted laws, including the Inflation Reduction Act, or IRA, and potential future legislation may increase the difficulty and cost for us to obtain regulatory approval of, and to commercialize our products and affect the prices we may obtain upon commercialization.
- Our relationships with customers, healthcare providers, clinical trial sites and professionals and third-party payors will be subject to applicable anti-kickback, fraud and abuse and other laws and regulations. If we fail to comply with federal, state and foreign laws and regulations, including healthcare, privacy and data security laws and regulations, we could face criminal sanctions, civil penalties, contractual damages, reputational harm and diminished profits and future earnings.

PART I

ITEM 1. BUSINESS

Overview

We are a late-stage biopharmaceutical company focused on discovering, developing and commercializing first-in-class muscle activators and next-in-class muscle inhibitors as potential treatments for debilitating diseases in which muscle performance is compromised and/or declining. We have discovered and are developing muscle-directed investigational medicines that may potentially improve the health span of people with devastating cardiovascular and neuromuscular diseases of impaired muscle function. Our research and development activities relating to the biology of muscle function have evolved from our knowledge and expertise regarding the cytoskeleton, a complex biological infrastructure that plays a fundamental role within every human cell. As a leader in muscle biology and the mechanics of muscle performance, we are developing small molecule drug candidates specifically engineered to impact muscle function and contractility.

Our research continues to drive innovation and leadership in muscle biology. All of our drug candidates have arisen from our cytoskeletal research activities. Our focus on the biology of the cytoskeleton distinguishes us from other biopharmaceutical companies, and potentially positions us to discover and develop novel therapeutics that may be useful for the treatment of severe diseases and medical conditions. Each of our drug candidates has a novel mechanism of action compared to currently marketed drugs, which we believe validates our focus on the cytoskeleton as a productive area for drug discovery and development. We intend to leverage our experience in muscle contractility to expand our current pipeline and expect to identify additional potential drug candidates that may be suitable for clinical development.

Corporate Strategy

As a leader in muscle biology and the mechanics of muscle performance, we are developing small molecule drug candidates specifically engineered to impact muscle function and contractility. Our goal is to discover, develop and commercialize novel drug products that modulate muscle function to improve patient health span, with the intent of establishing a fully-integrated biopharmaceutical company.

In 2020, we articulated our five-year strategic plan, Vision 2025: “Leading with Science, Delivering for Patients,” designed to enable Cytokinetics to become the leading muscle biology biopharmaceutical company that meaningfully improves the lives of patients with diseases of impaired muscle function through access to novel medicines arising from its research.

The key components of our five-year Corporate Strategy are:

- *Achieve regulatory approvals for at least two drugs arising from our pipeline.* We are committed to fueling a diverse and expansive pipeline of muscle-directed drug candidates advancing toward regulatory approval. As we advance our drug candidates into later-stage clinical development, we extensively evaluate previous clinical trial designs and results to assess key learnings that may be applied to our late-stage clinical development activities. We believe this may result in more successful later-stage clinical development activities that may increase the likelihood of achieving regulatory success and deliver effective therapies to patients that can address the needs of people living with devastating diseases of muscle impairment. Pursuing a broad-based clinical development strategy may afford us the opportunity to not be reliant on the outcome of a singular clinical program or clinical trial result, thereby potentially mitigating the risk of clinical development and regulatory hurdles. We or our partners have been conducting extensive clinical trials for our most advanced drug candidates and we believe that three drug candidates may be poised to achieve potential regulatory approval by 2025 and we strive to develop compelling scientific, clinical and value-driven rationales that may lead to regulatory approvals.

- *Build commercial capabilities to market and sell our medicines reflective of their innovation and value.* With a focus on disease areas for which there are serious unmet medical needs, we direct our activities to potential commercial opportunities in concentrated and tractable customer segments, such as hospital specialists and disease-specific centers of excellence, which may be addressed by smaller, targeted sales forces. In preparing for the potential commercialization of our drug candidates directed to these markets, we are focusing our activities on the key issues facing, physicians, patients and payors, including the principal drivers of clinical and economic burdens associated with these diseases. We have established alliances and collaborations with leading academic institutions and professional societies to analyze clinical and claims data to better understand the real-world burden of disease from a clinical and economic standpoint. We believe this approach may inform the value proposition that our potential first-in-class and next-in-class therapies may offer to various stakeholders within the healthcare ecosystem. Targeting unmet medical needs may provide us competitive advantages and support our development of a franchises in diseases involving muscle function. In the markets for our potential therapies, we believe that a company with limited resources may be able to compete effectively against larger, more established companies with greater financial and commercial resources. For these opportunities, we intend to build sales and marketing capabilities in North America and potentially in Europe with the goal of becoming a fully-integrated biopharmaceutical company.

- *Generate sustainable and growing revenues from product sales.* As we move toward becoming a fully integrated biopharmaceutical company, we expect to evolve our corporate development strategies to raise capital through a combination of strategic partnerships and equity capital financings to one that is sustained from product generated revenues that are expected to grow over time. We expect to successfully commercialize at least two of our drug candidates in the U.S. and potentially in Europe and achieve growing profitability. Through prudent investment spending fueled by commercial returns alongside other potential strategic partnerships and royalty monetization deals, we seek to provide investor returns while continuing to conduct proprietary research to support future commercial programs. Additionally, we strive to ensure sustainable growth of product sales and long-term profitability through lifecycle management strategies.

- *Double our development pipeline to include ten therapeutic programs.* We believe that our extensive understanding of muscle biology and our proprietary research activities should enable us to discover and potentially to develop additional muscle directed drug candidates with novel mechanisms of action that may offer potential benefits not provided by existing drugs and which may have application across a broad array of diseases and medical conditions. Progressing related programs in parallel may afford us an opportunity to build a broader business that could benefit from multiple products that serve related clinical and commercial needs associated with impaired muscle function, muscle weakness and fatigue. In addition, this strategy may enable us to diversify certain technical, financial and operating risks by advancing several drug candidates in parallel. In 2020 we advanced five potential drug candidates through various stages of clinical development. As part of our five-year Corporate Strategy, we intend to expand our research discovery platform beyond muscle contractility to support doubling our pipeline to ten therapeutic programs.

- *Expand our discovery platform to muscle energetics, growth and metabolism.* We expect that we may be able to leverage our expertise in muscle contractility to expand muscle biology research programs related to other areas of muscle function and which may extend to the potential treatment of other serious, yet adjacent, diseases and conditions. As most muscle-related diseases are accompanied by defects in metabolism or mitochondrial function, we also anticipate that treatments that modulate contractility could be additive with therapeutics that boost metabolic capacity. We can augment our industry-leading expertise in muscle contractility by building similar expertise in mitochondrial biology and technologies. Strategies toward enhancing our discovery platform into muscle energetics and metabolism include building human and capital resources for mitochondrial and metabolism research capabilities, expanding strategic academic partnerships, engaging the mitochondrial research community, engaging the mitochondrial disease advocacy community, and evaluating therapeutic and technology platforms for potential in-licensing.

- *Be the science-driven company people want to join and partner with.* We build our science around patients and their families through authentic and ongoing engagement and are committed to transforming patients' lives through our activities. Our goal is to provide employees with an opportunity to contribute to something bigger than any one of the individuals at the company. We believe that a commitment to a diverse, inclusive and respectful culture goes beyond what is "right" to do; it is foundational to building a successful, creative, and science driven company, and essential to develop a community of colleagues who are impassioned by our purpose to improve the lives of patients. As a patient-centric organization, we rely on an approach where clinical outcomes, patient experiences and patients' goals for care intersect. We value our partnerships with industry, professional societies, advocacy organizations, vendors and academic institutions and aim to solicit ongoing feedback to ensure interests are aligned and collaborations are successful.

Research and Development Programs

Our long-standing interest in the cytoskeleton has led us to focus our research and development activities on the biology of muscle function and, in particular, small molecule modulation of muscle contractility. We believe that our expertise in the modulation of muscle contractility is an important differentiator for us. Our preclinical and clinical experience in muscle contractility may position us to discover and develop additional novel therapies that have the potential to improve the health of patients with severe and debilitating diseases or medical conditions.

Small molecules that affect muscle contractility may have several applications for a variety of serious diseases and medical conditions. For example, heart failure is a disease often characterized by impaired cardiac muscle contractility which may be treated by modulating the contractility of cardiac muscle. Similarly, certain diseases and medical conditions associated with muscle weakness may be amenable to treatment by enhancing the contractility of skeletal muscle. Because the modulation of the contractility of different types of muscle, such as cardiac and skeletal muscle, may be relevant to multiple diseases or medical conditions, we believe we can leverage our expertise in these areas to more efficiently discover and develop potential drug candidates that modulate the applicable muscle type for multiple indications.

We segment our research and development activities related to muscle contractility by our cardiac muscle contractility program and our skeletal muscle contractility program. We also conduct research and development on novel treatments for disorders involving muscle function beyond muscle contractility.

Our research and development expenses were $240.8 million for 2022, $159.9 million for 2021, and $97.0 million for 2020.

Our Cardiac Muscle Program

Our cardiac muscle contractility program is focused on the cardiac sarcomere, the basic unit of muscle contraction in the heart. The cardiac sarcomere is a highly ordered cytoskeletal structure composed of cardiac myosin, actin and a set of regulatory proteins. Cardiac myosin is the cytoskeletal motor protein in the cardiac muscle cell. It is directly responsible for converting chemical energy into the mechanical force, resulting in cardiac muscle contraction. Our most advanced cardiac program is based on the hypothesis that activators of cardiac myosin may address certain adverse properties of existing positive inotropic agents. Current positive inotropic agents, such as beta-adrenergic receptor agonists or inhibitors of phosphodiesterase activity, increase the concentration of intracellular calcium, thereby increasing cardiac sarcomere contractility. The effect on calcium levels, however, also has been linked to potentially life-threatening side effects. In contrast, our novel cardiac myosin activators work by a mechanism that directly stimulates the activity of the cardiac myosin motor protein, without increasing the intracellular calcium concentration. They accelerate the rate-limiting step of the myosin enzymatic cycle and shift it in favor of the force-producing state. Rather than increasing the velocity of cardiac contraction, this mechanism instead lengthens the systolic ejection time, which results in increased cardiac function in a potentially more oxygen-efficient manner.

Our earlier stage cardiac program is based on the hypothesis that inhibitors of hyperdynamic contraction and obstruction of left ventricular blood flow may counteract the pathologic effects of mutations in the sarcomere that lead to hypertrophic cardiomyopathies. A targeted oral therapy addressing this disease etiology may improve symptoms, exercise capacity and potentially slow disease progression.

Omecamtiv mecarbil

We are developing omecamtiv mecarbil as a potential treatment across the continuum of care in heart failure both for use in the hospital setting and for use in the outpatient setting.

Omecamtiv mecarbil is a selective, small molecule cardiac myosin activator, the first of a novel class of myotropes designed to directly target the contractile mechanisms of the heart, binding to and recruiting more cardiac myosin heads to interact with actin during systole. Omecamtiv mecarbil is designed to increase the number of active actin-myosin cross bridges during each cardiac cycle and consequently augment the impaired contractility that is associated with heart failure with reduced ejection fraction, or HFrEF.

HFrEF is a grievous condition that is estimated to affect more than 32 million people worldwide an estimated half of whom have reduced left ventricular function. It is the leading cause of hospitalization and readmission in people age 65 and older. Despite broad use of standard treatments and advances in care, the prognosis for patients with heart failure is generally poor. An estimated one in five people over the age of 40 are at risk of developing heart failure, and approximately 50% of people diagnosed with heart failure will die within five years of initial hospitalization. Approximately 2 million people in the U.S. are estimated to have an ejection fraction <30%, indicating they may have worsening heart failure.

GALACTIC-HF

GALACTIC-HF is a Phase 3 cardiovascular outcomes clinical trial of omecamtiv mecarbil which was conducted by Amgen, in collaboration with Cytokinetics. The primary objective of this double-blind, randomized, placebo-controlled multicenter clinical trial is to determine if treatment with omecamtiv mecarbil when added to standard of care is superior to standard of care plus placebo in reducing the risk of cardiovascular death or heart failure events in patients with high risk chronic heart failure and reduced ejection fraction. GALACTIC-HF was conducted under an SPA with the FDA. GALACTIC-HF completed enrollment in mid-2019, having enrolled 8,256 symptomatic chronic heart failure patients with reduced ejection fraction in over 1,000 sites in 35 countries who were either currently hospitalized for a primary reason of heart failure or had had a hospitalization or admission to an emergency room for heart failure within one year prior to screening. Patients were randomized to either placebo or omecamtiv mecarbil with dose titration up to a maximum dose of 50 mg twice daily based on the plasma concentration of omecamtiv mecarbil after initiation of drug therapy. The primary endpoint is a composite of time to cardiovascular death or first heart failure event, whichever occurs first, with heart failure event defined as hospitalization, emergency room visit, or urgent unscheduled clinic visit for heart failure. Secondary endpoints include time to cardiovascular death; patient reported outcomes as measured by the KCCQ Total Symptom Score; time to first heart failure hospitalization; and time to all-cause death.

GALACTIC-HF: Primary Results

The results of GALACTIC-HF show that after a median duration of follow-up of 21.8 months, the trial demonstrated a statistically significant effect of treatment with omecamtiv mecarbil to reduce risk of the primary composite endpoint of CV death or heart failure events (heart failure hospitalization and other urgent treatment for heart failure) compared to placebo in patients treated with standard of care. A first primary endpoint event occurred in 1,523 of 4,120 patients (37.0%) in the omecamtiv mecarbil group and in 1,607 of 4,112 patients (39.1%) in the placebo group (hazard ratio, 0.92; 95% confidence interval [CI] 0.86, 0.99; p=0.025). This effect was observed without evidence of an increase in the overall rates of myocardial ischemic events, ventricular arrhythmias or death from cardiovascular or all causes.

The statistically significant reduction in the composite of heart failure events or CV deaths, without significant imbalances in the overall incidence of adverse events across treatment arms, was observed in one of the broadest and most diverse range of patients enrolled in a contemporary heart failure trial. GALACTIC-HF included both inpatients and outpatients, and with a high representation of participants with moderate to severe heart failure symptoms as well as lower ejection fraction, systolic blood pressure and renal function.

No reduction in the secondary endpoint of time to CV death was observed. Death from cardiovascular causes occurred in 808 (19.6%) patients treated with omecamtiv mecarbil and 798 patients (19.4%) assigned to placebo (hazard ratio, 1.01; 95% CI, 0.92 to 1.11; p=0.86). The pre-specified analysis of change from baseline to week 24 in the KCCQ total symptom score by randomization setting (inpatient mean difference [95% CI]: 2.50 [0.54, 4.46], outpatient mean difference: -0.46 [-1.40, 0.48], joint P = 0.028) did not meet the significance threshold of P=0.002 based upon the multiplicity control testing procedure. No other secondary endpoints were met in accordance with the prespecified statistical analysis.

The effect of omecamtiv mecarbil was consistent across most prespecified subgroups and with a potentially greater treatment effect suggested in patients with a lower LVEF (LVEF ≤28%, n=>4,000, hazard ratio, 0.84; 95% CI 0.77, 0.92; interaction p=0.003). Omecamtiv mecarbil also significantly decreased NT-proBNP concentrations by 10% (95% CI 6-14%) at Week 24 compared to placebo.

The overall safety profile of omecamtiv mecarbil in GALACTIC-HF appeared to be consistent with data from previous trials. Adverse events and treatment discontinuation of study drug were balanced between the treatment arms. In general, the overall rates of myocardial ischemia, ventricular arrhythmias and death were similar between treatment and placebo groups. Additionally, there was no significant difference in the change in systolic blood pressure between baseline and at 24 or 48 weeks between the omecamtiv mecarbil and placebo groups. There was a small but significant decrease in heart rate in participants assigned to omecamtiv mecarbil compared to placebo at both timepoints. Median cardiac troponin I concentration increased 4 ng/L (95% CI 3-5; limit of detection, 6 ng/L) from baseline with omecamtiv mecarbil compared to placebo.

GALACTIC-HF: Further Analyses

Since our release of the primary results, we have conducted and announced supplemental and subgroup analyses suggesting that certain subgroups of patients treated with omecamtiv mecarbil in GALACTIC-HF may benefit more than the general patient population in such trial.

For example, additional results showed that the effect of omecamtiv mecarbil on the primary composite endpoint in GALACTIC-HF was consistent across most prespecified subgroups and with a potentially greater treatment effect suggested in patients with a lower LVEF (LVEF ≤28%, n=4,456, hazard ratio, 0.84; 95% CI 0.77, 0.92; interaction p=0.003). Supplemental analyses of this lower ejection fraction subgroup in GALACTIC-HF showed that this potentially greater treatment effect in patients who received omecamtiv mecarbil was consistently observed in patients with characteristics that may indicate advanced heart failure status, such as being hospitalized within the last 3 months (HR 0.83, 95% CI 0.74 – 0.93, p=0.001), having New York Association Class III or IV heart failure (HR 0.80, 95% CI 0.71 – 0.90, p<0.001), higher N-terminal-pro brain natriuretic peptide levels (HR 0.77, 95% CI 0.69 – 0.87, p<0.001), and lower blood pressures (HR 0.81, 95% CI 0.70 – 0.92, p=0.002). The ARR ranged from 5.2% to 8.1% in these subgroups as compared to the ARR of 2.1% observed in the overall population. Additionally, a supplemental analysis of the continuous relationship between ejection fraction and the hazard ratio for the primary composite endpoint in GALACTIC-HF suggested a potentially stronger treatment effect of omecamtiv mecarbil in patients with increasingly lower ejection fractions.

Another analysis assessed the effect of omecamtiv mecarbil on clinical outcomes in relationship to patient baseline ejection fraction by evaluating the effect of patient treatment with omecamtiv mecarbil based on quartiles of baseline EF defined as EF ≤22%, EF 23-28%, EF 29-32% and EF ≥33% as well as considering baseline EF as a continuous variable. The incidence of the primary outcome of first heart failure event or cardiovascular death increased with decreasing ejection fraction; in the lowest LVEF quartile (EF ≤22%) the incidence (35.6 per 100 patient-years) was almost 80% greater than in the highest EF quartile (EF ≥33%; 20 per 100 patient-years). Treatment with omecamtiv mecarbil demonstrated a 15% (HR 0.85; 95% CI 0.74-0.97; p = 0.016) and 17% (HR 0.83; 95% CI 0.73-0.95; p = 0.005) relative risk reduction in the lower two quartiles, respectively, compared to no difference in the upper two quartiles.

Analysis of ejection fraction as a continuous variable demonstrated a progressively larger treatment effect of omecamtiv mecarbil with decreasing ejection fraction. Accordingly, the absolute treatment effect on the primary composite endpoint also increased between the patients treated with placebo and omecamtiv mecarbil as baseline ejection fraction decreased such that in the lowest ejection fraction quartile, there was an absolute reduction of 7.4 events per 100 patient-years, with a number-needed-to-treat of 11.8 patients necessary to prevent an event over three years.

An analysis of patients with low blood pressure showed that there was a greater treatment effect from omecamtiv mecarbil on the primary composite endpoint of cardiovascular death or first heart failure event than in patients without low blood pressure such that there was an absolute risk reduction of 9.8 events per 100 patient-years (hazard ratio, 0.81; 95% confidence interval [CI] 0.70, 0.94; interaction p=0.051). Patients with low blood pressure treated with omecamtiv mecarbil also experienced improvements in blood pressure over time as did those treated with placebo. Additionally, the incidence of treatment-emergent serious adverse events in patients with low blood pressure who received omecamtiv mecarbil (RR 0.88; 95% CI 0.82, 0.95; p<0.001) and adjudicated first stroke (RR 0.31; 95% CI 0.12, 0.79; p=0.009) was lower compared to placebo.

An analysis of Black patients participating in GALACTIC-HF showed that treatment with omecamtiv mecarbil resulted in a trend towards reduction in the primary endpoint by 18% (HR=0.82, 95% CI 0.64-1.04), corresponding to a reduction in the primary event rate of 7.7/100 patient-years with a number-needed-to-treat of 13 patients. This result, like the overall study results, was driven primarily by a reduction in HF hospitalizations (HR=0.80) and HF events (HR=0.82), with no effect on cardiovascular mortality (HR=1.03). There were no significant differences in adverse events in Black patients between the groups treated with omecamtiv mecarbil and placebo.

A further analysis indicated that the rate of the primary outcome in GALACTIC-HF was higher in hospitalized patients in the placebo group (38.3/100 person-years [PY]) than in outpatients (23.1/100 PY) with an adjusted hazard ratio (HR) of 1.21 (95% CI 1.12, 1.31). There was a stepwise gradient in risk, with those randomized as outpatients in the placebo group within 3 months of a heart failure event at the highest risk (26.6/100 patient years (PY)) as compared with those 9-12 months post-event (19.0/100 PY) with an adjusted hazard ratio (HR) of 1.20 (95% CI 1.01, 1.42), p for trend = 0.008). The effect of omecamtiv mecarbil versus placebo on the primary outcome was similar in hospitalized patients (HR 0.89, 95% CI 0.78, 1.01) and outpatients (HR 0.94, 95% CI 0.86, 1.02), indicating that omecamtiv mecarbil similarly reduced the risk of the primary outcome both when initiated in hospitalized patients and in outpatients. In both hospitalized patients and outpatients, the initiation of omecamtiv mecarbil was safe and well tolerated. Treatment-emergent serious adverse events occurred more frequently in patients randomized during hospitalization but did not differ significantly between the treatment groups.

New Drug Application/Regulatory

On February 28, 2023, we announced that we received a CRL from the FDA's Division of Cardiology and Nephrology regarding our NDA for omecamtiv mecarbil for the treatment of HFrEF. According to the CRL, GALACTIC-HF is not sufficiently persuasive to establish substantial evidence of effectiveness for reducing the risk of heart failure events and cardiovascular death in adults with chronic heart failure with HFrEF, in lieu of evidence from at least two adequate and well-controlled clinical investigations. In addition, FDA stated that results from an additional clinical trial of omecamtiv mecarbil are required to establish substantial evidence of effectiveness for the treatment of HFrEF, with benefits that outweigh the risks. FDA's decision to issue a CRL follows an FDA Cardiovascular and Renal Drugs Advisory Committee's vote of 8 to 3 in December 2022 that the benefits of omecamtiv mecarbil do not outweigh its risks for the treatment of HFrEF.

We expect to request a meeting with FDA in order to understand FDA's views regarding the CRL and what may be required to support potential approval of omecamtiv mecarbil in the United States. However, we have no plans to conduct an additional clinical trial of omecamtiv mecarbil. No assurance can be given that we will be able to address any of the deficiencies noted in the CRL and/or obtain FDA approval of our NDA for omecamtiv mecarbil.

In December 2022, the EMA accepted for review our MAA seeking approval of omecamtiv mecarbil for the treatment of HFrEF in the E.U. and the other states of the EEA, and in November 2022, our partner, Ji Xing announced that the Center for Drug Evaluation of the National Medical Products Administration of the People's Republic of China had accepted the submission of the NDA for omecamtiv mecarbil for the treatment of HFrEF.

Ji Xing Collaboration for Greater China

On December 20, 2021, we entered into the Ji Xing OM License Agreement, pursuant to which we granted to Ji Xing an exclusive license to develop and commercialize omecamtiv mecarbil in China and Taiwan. Under the terms of the Ji Xing OM License Agreement, we may be eligible to receive from Ji Xing additional payments totaling up to $330.0 million for the achievement of certain commercial milestone events in China in connection to omecamtiv mecarbil. In addition, Ji Xing will pay us tiered royalties in the mid-teens to the low twenties range on the net sales of pharmaceutical products containing omecamtiv mecarbil in China and Taiwan, subject to certain reductions for generic competition, patent expiration and payments for licenses to third party patents. The Ji Xing OM License Agreement, unless terminated earlier, will continue on a market-by-market basis until expiration of the relevant royalty term.

Royalty Pharma Revenue Interest

In 2017, we entered into a Royalty Purchase Agreement, which we refer to as the RP OM RPA, with Royalty Pharma Development Funding, LLC, or RPFT, and amended the RP OM RPA on January 7, 2022. Pursuant to the RP OM RPA, as amended, RPFT has a revenue interest entitling it to up to 5.5% of our and our affiliates' and licensees' worldwide net sales of omecamtiv mecarbil. If FDA approves omecamtiv mecarbil at any time after June 30, 2023, the royalty rate at which payments are owed to RPFT will be 5.5%.

Aficamten

Aficamten is a novel, oral, small molecule cardiac myosin inhibitor that our company scientists discovered. Aficamten arose from an extensive chemical optimization program conducted with attention to therapeutic index and pharmacokinetic properties that may translate into next-in-class potential in clinical development. Aficamten was purposely designed to reduce the hypercontractility that is associated with HCM. In preclinical models, aficamten reduces myocardial contractility by binding directly to cardiac myosin at a distinct and selective allosteric binding site, thereby preventing myosin from entering a force producing state. Aficamten reduces the number of active actin-myosin cross bridges during each cardiac cycle and consequently reduces myocardial contractility. This mechanism of action may be therapeutically effective in conditions characterized by excessive hypercontractility, such as HCM. The preclinical pharmacokinetics of aficamten were characterized evaluated and optimized for potential rapid onset, ease of titration and rapid symptom relief in the clinical setting. The initial focus of the development program for aficamten will include an extensive characterization of its pharmacokinetics/pharmacodynamic ("PK/PD") relationship as has been a hallmark of Cytokinetics' industry-leading development programs in muscle pharmacology. The overall development program will assess the potential of aficamten to improve exercise capacity and relieve symptoms in patients with hyperdynamic ventricular contraction due to HCM.

HCM is a disease in which the heart muscle (myocardium) becomes abnormally thick (hypertrophied). The thickening of cardiac muscle leads to the inside of the left ventricle becoming smaller and stiffer, and thus the ventricle becomes less able to relax and fill with blood. This ultimately limits the heart's pumping function, resulting in symptoms including chest pain, dizziness, shortness of breath, or fainting during physical activity. A subset of patients with HCM are at high risk of progressive disease which can lead to atrial fibrillation, stroke and death due to arrhythmias.

FDA has granted aficamten orphan drug designation for the treatment of symptomatic HCM and Breakthrough Therapy Designation for aficamten for the treatment of oHCM.

REDWOOD-HCM

REDWOOD-HCM is a Phase 2, multi-center, randomized, placebo-controlled, double-blind, dose finding clinical trial of aficamten in patients with symptomatic HCM.

In Cohorts 1 and 2 of REDWOOD-HCM, patients continued taking background medications exclusive of disopyramide. Results from Cohorts 1 and 2 showed that treatment with aficamten for 10 weeks resulted in statistically significant reductions from baseline compared to placebo in the average resting LVOT-G ($p=0.0003$, $p=0.0004$, Cohort 1 and Cohort 2, respectively) and the average post-Valsalva LVOT-G ($p=0.001$, $p<0.0001$, Cohort 1 and Cohort 2, respectively). A large majority of patients treated with aficamten achieved the target goal of treatment, defined as resting gradient <30 mmHg and post-Valsalva gradient <50 mmHg at Week 10, compared to placebo. Patients treated with aficamten also saw improvements in heart failure symptoms and reductions in NT-proBNP, a biomarker of cardiac wall stress.

Treatment with aficamten in Cohorts 1 and 2 of REDWOOD-HCM was generally well tolerated. The incidence of adverse events was similar between treatment arms. No serious adverse events were attributed to aficamten and no treatment interruptions occurred on aficamten. No new cases of atrial fibrillation in patients treated with aficamten were reported. In this dose-range finding trial, one patient experienced a transient decrease in LVEF that required dose adjustment but not dose interruption. LVEF returned to baseline within two weeks after the end of treatment in both cohorts, which was consistent with the reversibility of LVEF decreases that were similarly observed in healthy participants in the Phase 1 study of aficamten.

A subsequent analysis investigated changes from baseline in echocardiographic measures of cardiac structure and function after 10 weeks of treatment with aficamten compared with placebo. At baseline, all patients (n=41) enrolled in Cohorts 1 and 2 of REDWOOD-HCM had severe LVOT obstruction, 88% had associated SAM of the mitral valve, and 90% had mitral regurgitation. SAM occurs when the mitral valve leaflet gets pushed against the interventricular septum during systole, resulting in obstruction of the LVOT and mitral regurgitation. Measures of cardiac structure, diastolic and mitral valve function improved at Week 10 in patients treated with aficamten. There was a significant reduction in left atrial volume index ($p<0.01$) and a trend towards a reduction in left ventricular hypertrophy (left ventricular mass index; $p=0.06$). Treatment with aficamten also resulted in improved ventricular relaxation and filling, as indicated by a reduction in lateral E/e' ($p<0.01$) and an increase in lateral e' ($p<0.05$). Additionally, treatment with aficamten improved mitral valve dynamics as noted by a reduction in the proportion of patients with SAM (placebo: 92.3% at baseline to 75.0% at Week 10; aficamten: 85.7% at baseline to 35.7% at Week 10; $p=0.038$ for comparison to placebo) and a trend towards a reduction in those with eccentric mitral regurgitation (placebo: 25.0% at baseline to 33.3% at Week 10; aficamten: 42.9% at baseline to 7.1% at Week 10; $p=0.055$ for comparison to placebo) at Week 10. Together, these data point to evidence of early signs of improved cardiac function and structure and improved mitral valve dynamics after a 10-week treatment period with aficamten.

Cohort 3 of REDWOOD-HCM enrolled thirteen patients with symptomatic oHCM and a resting or post-Valsalva LVOT-G of ≥50 mmHg whose background therapy included disopyramide and, in the majority (11 out of 13 patients), a beta-adrenergic blocker. These patients remained symptomatic despite use of disopyramide and represent a group of patients resistant to available medical therapies. Patients in Cohort 3 demonstrated a substantial reduction in the mean (± SD) resting LVOT-G (from 50 ± 25 at baseline to 24 ± 17 mmHg at Week 10) and Valsalva LVOT-G (from 78 ± 27 to 50 ± 25 mmHg). For the resting LVOT-G, the least square mean difference (± SE) for the change from baseline to Week 10 was -28 ± 3.2 mmHg ($p < 0.0001$) and for the Valsalva LVOT-G was -27 ± 5.9 mmHg ($p = 0.0002$). The relief of obstruction was accompanied by a modest reduction in LVEF (from 74 ± 7% at baseline to 69 ± 7% at Week 10). For LVEF, the least square mean difference (± SE) for the change from baseline to Week 10 was -4.8 ± 1.9% ($p = 0.018$). There were no patients who experienced a reduction in LVEF below the prespecified safety threshold of 50%. Treatment with aficamten resulted in 6 of the 13 patients (46%) experiencing a complete hemodynamic response by Week 10, with the remaining 7 (54%) still eligible for dose escalation to the highest dose of aficamten (20 mg) employed in SEQUOIA-HCM, the Phase 3 trial. Eleven of 13 patients (85%) experienced improvement in NYHA class by at least one class. In addition to hemodynamic and functional capacity improvements, patients also experienced a significant improvement in NT-proBNP and trended to lower hs-troponin I. The safety and tolerability of aficamten were consistent with prior experience in Cohorts 1 and 2 of REDWOOD-HCM with no dose interruptions or treatment discontinuations and no serious adverse events. Coadministration of aficamten along with disopyramide and beta-blockers or calcium-channel blockers did not result in any significant electrocardiographic changes including in the QT-interval, or in blood pressure or heart rate.

Cohort 4 of REDWOOD-HCM has completed enrollment. Cohort 4 enrolled, in an open label fashion, 30-40 patients with symptomatic nHCM receiving background medical therapy. At screening, patients must have a LVEF of ≥60%, an elevated NT-proBNP >300 pg/mL, and must not have resting or post-Valsalva LVOT gradients (<30 mmHg in each case). The primary objective is to determine the safety and tolerability of aficamten in patients with nHCM. Other objectives include the effect of aficamten on LVEF, NYHA Functional Class and cardiac biomarkers. All patients will receive up to three escalating doses of aficamten, with doses being adjusted based on echocardiography according to LVEF alone. Cohort 4 will employ doses of 5, 10 and 15 mg once daily. Overall treatment duration will be 10 weeks with a 4-week follow up period after the last dose. We expect to present results of Cohort 4 of REDWOOD-HCM at the American College of Cardiology Annual Meeting in March, 2023

SEQUOIA-HCM

SEQUOIA-HCM is a Phase 3 randomized, placebo-controlled, double-blind, multi-center clinical trial designed to evaluate aficamten in patients with symptomatic oHCM on background medical therapy for 24 weeks. The primary objective is to assess the effect of aficamten on change in peak oxygen uptake (pVO2) measured by CPET from baseline to week 24. Secondary objectives include change in KCCQ score from baseline to week 12 and week 24, the proportion of patients with ≥1 class improvement in NYHA Functional Class from baseline to week 12 and week 24, change in post-Valsalva LVOT-G to week 12 and week 24, the proportion of patients with post-Valsalva LVOT-G <30 mmHg, and change in total workload during CPET to week 24.

SEQUOIA-HCM is open for enrollment. We have now enrolled more than two-thirds of the targeted 270 patients. In SEQUOIA-HCM, this trial is enrolling patients randomized on a 1:1 basis to receive aficamten or placebo in addition to standard-of-care treatment. Each patient will receive up to four escalating doses of aficamten or placebo based on echocardiographic guidance alone. At screening, patients enrolled in SEQUOIA-HCM must have a resting LVOT-G ≥30 mmHg, post-Valsalva peak LVOT-G ≥50 mmHg, and be NYHA Class II or III. Patients receiving aficamten will begin with 5 mg dosed once daily. At weeks 2, 4 and 6 patients will receive an echocardiogram to determine if they will be up-titrated to escalating doses of 10, 15 or 20 mg. Dose escalation will occur only if a patient has a post-Valsalva LVOT-G ≥30 mmHg and a biplane LVEF ≥55%. Patients who do not meet escalation criteria will continue to receive their current dose or may be down-titrated if appropriate.

We expect to announce topline results from SEQUOIA-HCM in the fourth quarter of 2023.

MAPLE-HCM

We are preparing for the second Phase 3 clinical trial of aficamten as monotherapy in patients with oHCM, MAPLE-HCM (Metoprolol vs Aficamten in Patients with LVOT Obstruction on Exercise Endpoints in HCM). We expect to begin MAPLE-HCM in the first half of 2023. MAPLE-HCM is a Phase 3, multi-center, randomized, double-blind, active-comparator trial in patients with symptomatic oHCM and elevated LVOT gradient. It is expected to enroll approximately 170 patients. The primary endpoint is change in peak oxygen uptake (pVO2), assessed by CPET from baseline to Week 24. Secondary endpoints include change in NYHA class, KCCQ, N-terminal prohormone brain natriuretic peptide (NT-proBNP), and measures of structural remodeling.

FOREST-HCM (formerly REDWOOD-HCM OLE)

In May 2021, we announced that the first site had been activated to enroll patients in REDWOOD-HCM OLE, an open-label extension clinical study designed to assess the long-term safety and tolerability of aficamten in patients with symptomatic oHCM. Eligible patients were initially to have completed participation in REDWOOD-HCM. However, since initiation of the open-label extension clinical study, we expanded eligibility to include patients having participated in SEQUOIA-HCM, our first Phase 3 clinical trial of aficamten for the treatment of oHCM, and as a result, the trial has been renamed FOREST-HCM.

On May 23, 2022, we announced positive data relating to 38 patients, including 30 patients treated for 12 weeks and 19 patients treated for 24 weeks. The data showed that treatment with aficamten was associated with substantial reductions in the average resting LVOT-G (mean change from baseline (SD) = -32.6 (28) mmHg, p<0.0001 at 12 weeks, -32.8 (32.3) mmHg, p=0.0003 at 24 weeks) and Valsalva LVOT-G (-42.7 (38.7) mmHg, p<0.0001 at 12 weeks, -51.1 (35.3) mmHg, p<0.0001 at 24 weeks). These reductions started to occur within two weeks of treatment, were sustained through 24 weeks of treatment, and were achieved with only modest decreases in the average LVEF (-3.2 (4.2) %, p=0.0038 at 24 weeks). Compared to baseline (47% Class II, 53% Class III), NYHA Functional Class was improved in the majority of patients (p<0.0001 for improvement by one or more NYHA class), and no patients had a worsening of NYHA Class. At 12 weeks, 72% of patients improved by one class and 7% improved by two classes; at 24 weeks 61% of patients improved by one class and 17% improved by two classes. For patients reaching Week 24, 56% were Class I and 39% were Class II. There were also significant improvements in cardiac biomarkers including NTpro-BNP (reduction of 70% from baseline, p<0.001) and cardiac troponin (20% reduction, p=0.002). Treatment with aficamten was well-tolerated with one temporary discontinuation due to LVEF <50% and one temporary down-titration, neither related to drug. Both patients remain on treatment with aficamten.

On September 30, 2022, we announced new data on the reduction and withdrawal of background standard of care medical therapy in patients treated with aficamten in FOREST-HCM. Patients in FOREST-HCM were classified as receiving standard of care therapy if they were being treated with at least a beta-blocker, nondihydropyridine calcium channel blocker, or disopyramide. Patients were eligible for BTR/W at the discretion of the site investigator, only after Week 12 and after having received a stable dose of aficamten for at least four weeks. Of 42 patients enrolled at the time of this analysis, 39 (93%) were taking ≥1 standard of care medication, and of those, 27 (69%) were receiving a beta-blocker only, 4 (10%) were receiving a calcium channel blocker only, 7 (18%) were receiving disopyramide and either a calcium channel blocker or beta-blocker, and 1 patient (3%) was receiving all three therapies. Of the 35 patients who had completed treatment with aficamten through Week 12, BTR/W was attempted in 20 patients. 17 patients (85%) achieved successful BTR/W, defined as at least one dose reduction of one medication to ≤50% of the baseline dose. Ten patients completely discontinued at least one medication, and 5 withdrew from all standard of care therapies. BTR/W was unsuccessful in three patients, who reinstituted a beta-blocker as a result of recurrence of symptoms or elevated LVOT-G. NYHA Functional Class and NT-proBNP and high-sensitivity troponin I levels remained stable before and after BTR/W. In 14 patients with an available assessment before and after BTR/W, BTR/W resulted in an increase in resting heart rate of 12 bpm (mean HR=74 ±10 bpm, p=0.0001) and Valsalva LVOT-G of 15 mmHg (mean Valsalva LVOT-G=42 ±26 mmHg, p=0.02). This data suggests that patients who achieved successful BTR/W experienced similar benefits from treatment with aficamten as those who remained on background standard of care therapy, and warrants further study.

On October 2, 2022, we announced new data on symptom improvement and quality of life related to treatment with aficamten in FOREST-HCM. This new analysis evaluated patients' self-reported health status using the KCCQ and compared baseline values to those collected at Week 12 and Week 24. The KCCQ is a validated patient reported outcomes tool 1 used to evaluate heart failure symptoms and their impact on social and physical limitations as well as quality of life. Higher scores indicate better health status. As early as Week 12, patients experienced substantial and significant symptom improvements as measured by the change in their KCCQ scores. The KCCQ-OSS and all KCCQ sub-domain scores demonstrated these improvements, improvements which were also noted to be sustained through Week 24. At 12 and 24 weeks, the change from baseline (mean [SD]) change in KCCQ-OSS was 16.5 [16.7] ($p<0.0001$) and 17.6 [24.7] (p=0.0015). The proportion of patients with clinically important improvements (improvement ≥5 points on the KCCQ-OSS) was 72.7% at Week 12 and 72.0% at Week 24, and 36.4% of patients at Week 12 and 40.0% at Week 24 reported a very large clinical improvement (≥20 points). We will be presenting the results from twelve months of treatment with aficamten in FOREST-HCM at the American College of Cardiology 72nd Annual Scientific Session in March, 2023.

FOREST-HCM continues to enroll patients.

Ji Xing Collaboration for Greater China

On July 14, 2020, we entered into the Ji Xing Aficamten License Agreement, pursuant to which we granted to Ji Xing an exclusive license to develop and commercialize aficamten in China and Taiwan. Under the terms of the Ji Xing Aficamten License Agreement, we may be eligible to receive from Ji Xing milestone payments totaling up to $200.0 million for the achievement of certain development and commercial milestone events in connection to aficamten in the field of oHCM, and/or nHCM and other indications. In addition, Ji Xing will pay us tiered royalties in the low-to-high teens range on the net sales of pharmaceutical products containing aficamten in China and Taiwan, subject to certain reductions for generic competition, patent expiration and payments for licenses to third party patents. The Ji Xing Aficamten License Agreement, unless terminated earlier, will continue on a market-by-market basis until expiration of the relevant royalty term.

Royalty Pharma Revenue Interest

On January 7, 2022, we entered into a Revenue Participation Right Purchase Agreement, which we refer to as the RP Aficamten RPA, with Royalty Pharma Investments 2019 ICAV, which we refer to as RPI ICAV, pursuant to which RPI ICAV purchased rights to certain revenue streams from net sales of pharmaceutical products containing aficamten by us, our affiliates and our licensees in exchange for up to $150.0 million in consideration, $50.0 million of which was paid on the closing date, $50.0 million of which was paid to us on March 10, 2022 following the initiation of the first pivotal trial in oHCM for aficamten and $50.0 million of which is payable following the initiation of the first pivotal clinical trial in nHCM for aficamten. The RP Aficamten RPA also provides that the parties will negotiate terms for additional funding if we achieve proof of concept results in certain other indications for aficamten, with a reduction in the applicable royalty if we and RPI ICAV fail to agree on such terms in certain circumstances.

Pursuant to the RP Aficamten RPA, RPI ICAV purchased the right to receive a percentage of net sales equal to 4.5% for annual worldwide net sales of pharmaceutical products containing aficamten up to $1 billion and 3.5% for annual worldwide net sales of pharmaceutical products containing aficamten in excess of $1 billion, subject to reduction in certain circumstances.

CK-136

CK-136 is a novel, selective, oral, small molecule cardiac troponin activator. In preclinical models, CK-136 increases myocardial contractility by binding to cardiac troponin through an allosteric mechanism that sensitizes the cardiac sarcomere to calcium, facilitating more actin-myosin cross bridge formation during each cardiac cycle thereby resulting in increased myocardial contractility. Similar to cardiac myosin activation, preclinical research has shown that cardiac troponin activation does not change the calcium transient of cardiac myocytes.

Dosing of patients in a Phase 1 clinical trial of CK-136 commenced in December 2022. The primary objective of this Phase 1 randomized, double-blind, placebo-controlled, single and multiple ascending dose trial is to assess the safety, tolerability and pharmacokinetics of CK-136 when administered orally as single or multiple doses to healthy participants. The study design includes three groups of at least eight participants in single ascending dose cohorts and four groups of at least eight participants in multiple-dose ascending cohorts. A final optional cohort will include eight participants in an open-label, 2-period crossover arm to investigate the effect of food on CK-136.

Our Skeletal Muscle Contractility Program

Our skeletal muscle contractility program is focused on the activation of the skeletal sarcomere, the basic unit of skeletal muscle contraction. The skeletal sarcomere is a highly ordered cytoskeletal structure composed of skeletal muscle myosin, actin, and a set of regulatory proteins, which include the troponins and tropomyosin. This program leverages our expertise developed in our ongoing discovery and development of cardiac sarcomere activators.

We believe that our skeletal sarcomere activators may lead to new therapeutic options for diseases and medical conditions associated with neuromuscular dysfunction and potentially also conditions associated with aging and muscle weakness and wasting. The clinical effects of muscle weakness and wasting, fatigue and loss of mobility can range from decreased quality of life to, in some instances, life-threatening complications. By directly improving skeletal muscle function, a small molecule activator of the skeletal sarcomere potentially could enhance functional performance and quality of life in patients suffering from diseases or medical conditions associated with skeletal muscle weakness or wasting, such as ALS, SMA, chronic obstructive pulmonary disease (COPD) or sarcopenia (general frailty associated with aging).

ALS is a progressive, degenerative neuromuscular disease that affects the nerve cells in the brain and spinal cord. These motor neurons carry messages from the brain to the spinal cord and, ultimately, to the muscles that are necessary for voluntary and involuntary movement and function. in people living with ALS, motor neurons progressively die and the brain can no longer communicate with the muscles through the spinal cord. As muscles are used less and less frequently, they can atrophy, causing people with ALS to lose the ability to perform everyday activities, such as walking, speaking, and eating. ALS also affects the diaphragm, an essential muscle responsible for breathing, so people with ALS eventually lose their ability to breathe on their own. The average life expectancy for ALS patients is three to five years after diagnosis and death is generally caused by respiratory failure. There is no known cause or cure for ALS.

Reldesemtiv

We are developing reldesemtiv, a FSTA, as a potential treatment for people living with debilitating diseases and conditions associated with muscular weakness, and/or muscle fatigue, including ALS.

Reldesemtiv is an investigational drug candidate intended to slow the rate of calcium release from the regulatory troponin complex of fast skeletal muscle fibers. Contraction of skeletal muscles is driven by the sarcomere, the fundamental unit of muscle contraction, which contains myosin, a protein which converts chemical energy into mechanical force through its interaction with another protein, actin. This interaction is regulated by other proteins including troponin and tropomyosin, and is dependent on changes in calcium. By slowing the rate of calcium release, reldesemtiv sensitizes the sarcomere to calcium, leading to an increase in muscle contractility.

Reldesemtiv has demonstrated pharmacological activity in preclinical models and evidence of potentially clinically relevant pharmacodynamic effects in humans. The FDA granted reldesemtiv orphan drug designation for the potential treatment of ALS. The EMA granted reldesemtiv orphan medicinal product designation for the potential treatment of ALS.

FORTITUDE-ALS

Reldesemtiv was the subject of FORTITUDE-ALS. This Phase 2 trial enrolled 458 eligible ALS patients who were randomized (1:1:1:1) to receive either 150 mg, 300 mg or 450 mg of reldesemtiv or placebo dosed orally twice daily for 12 weeks. The primary efficacy endpoint of FORTITUDE-ALS was the change from baseline in the percent predicted SVC at 12 weeks. Secondary endpoints included slope of the change from baseline in the mega-score of muscle strength measured by hand held dynamometry and handgrip dynamometry in patients on reldesemtiv; change from baseline in the ALSFRS-R; incidence and severity of treatment-emergent adverse events; and plasma concentrations of reldesemtiv at the sampled time points during the study. Exploratory endpoints measured included the effect of reldesemtiv versus placebo on self-assessments of respiratory function made at home by the patient with help as needed by the caregiver; disease progression through quantitative measurement of speech production characteristics over time; disease progression through quantitative measurement of handwriting abilities over time; and the change from baseline in quality of life (as measured by the ALS Assessment Questionnaire-5) in patients on reldesemtiv.

In FORTITUDE-ALS, reldesemtiv did not achieve statistical significance for a pre-specified dose-response relationship in its primary endpoint of change from baseline in SVC after 12 weeks of dosing (p=0.11). Similar analyses of ALSFRS-R and slope of the Muscle Strength Mega-Score yielded p-values of 0.09 and 0.31, respectively. However, patients on all dose groups of reldesemtiv declined numerically less than patients on placebo for SVC and ALSFRS-R, with larger differences emerging over time.

While the dose-response analyses for the primary and secondary endpoints did not achieve statistical significance at the level of 0.05, in a post-hoc analysis pooling the doses together, patients who received reldesemtiv in FORTITUDE-ALS declined less than patients who received placebo. The trial showed numerical effects favoring reldesemtiv across dose levels and timepoints with clinically meaningful magnitudes of effect observed at 12 weeks for the primary and secondary endpoints. The differences between reldesemtiv and placebo in SVC and ALSFRS-R total score observed after 12 weeks of treatment were still evident at follow-up, four weeks after the last dose of study drug.

The incidence of early treatment discontinuations, serious adverse events and clinical adverse events in FORTITUDE-ALS were similar between placebo and active treatment arms. The most common clinical adverse effects in the trial included fatigue, nausea and headache. The leading cause for early termination from FORTITUDE-ALS for patients who received placebo was progressive disease; the leading cause for early termination for patients who received reldesemtiv was a decline in cystatin C based eGFR, a measure of renal function. Elevations in transaminases and declines in cystatin C eGFR were dose-related.

Post-hoc analyses from FORTITUDE-ALS demonstrated that, in the combined middle and faster progressing tertiles of patients, the decline in the ALSFRS-R total score from baseline to week 12 in patients who received any dose of reldesemtiv was significantly smaller than the decline on placebo, while no significant difference between reldesemtiv and placebo was observed in slower progressing patients.

Additional post-hoc analyses from FORTITUDE-ALS evaluated how baseline patient characteristics impacted the effect of treatment with reldesemtiv versus placebo. When patients were divided into faster, middle and slower progressing tertiles based on pre-study ALSFRS-R progression rates, the middle and fastest progressing tertiles of patients combined showed a 27% difference at 12 weeks between patients receiving reldesemtiv versus placebo (1.15 ALSFRS-R points, p=0.011), compared to 18% (0.4 points; p=0.43) in the slowest progressing tertile. In general, patients with a longer symptom duration were slower progressors; 59% of those with SD >24 months were in the slowest tertile. Most patients who were minimally affected with an ALSFRS-R ≥45 at baseline were also slow progressors. In comparing the treatment effect of slow progressing patients with symptoms ≤24 months and a baseline ALSFRS-R score of ≤44 to the original primary analysis population, the effect size and statistical significance increased, despite reducing the number of analyzed patients. In an analysis of the total study population (n=458), combining all patients who received reldesemtiv and comparing to those who received placebo, the change from baseline to week 12 in the ALSFRS-R total score showed a LSM difference of 0.87 (p=0.013). However, limiting the analysis population to patients with symptoms ≤24 months and a baseline ALSFRS-R score of ≤44 (n=272), the LSM difference was 1.84 (p=0.0002). Together, these post-hoc analyses indicate that the impact of treatment with reldesemtiv was more apparent in patients with faster pre-study rates of progression, which include patients with short symptom duration and lower baseline ALSFRS-R scores.

A subgroup analyses of FORTITUDE-ALS showed that the effect of reldesemtiv on patients with ALS was similar whether or not patients were also receiving RADICAVA® (edaravone) and/or RILUTEK® (riluzole).

COURAGE-ALS

COURAGE-ALS is the Phase 3 clinical trial of reldesemtiv in patients with ALS, which is currently open for enrollment. COURAGE-ALS has enrolled over 450 patients or more than three-quarters of our target patient enrollment with a goal to enroll approximately 555 patients with ALS. Patients will be randomized 2:1 to receive 300 mg of reldesemtiv or matching placebo dosed orally twice daily for 24 weeks, followed by a 24-week period in which all patients will receive 300 mg of reldesemtiv twice daily. Eligible patients will be within the first two years of their first symptom of muscle weakness, have a vital capacity of ≥65% predicted, and a screening ALSFRS-R ≤44. Patients currently taking stable doses of RADICAVA® (edaravon*e*) and/or RILUTEK® (riluzol*e*) will be permitted and randomization stratified accordingly. The primary efficacy endpoint will be change from baseline to 24 weeks in ALSFRS-R. Secondary endpoints include combined assessment of ALSFRS-R total score; time to onset of respiratory insufficiency and survival time up to week 24 using a joint rank test; change from baseline to 24 weeks for vital capacity; ALSAQ-40; and bilateral handgrip strength. Two unblinded interim analyses by the DMC are planned. The first will assess for futility, 12 weeks after approximately one-third or more of the planned sample size is randomized. A second interim analysis will also assess for futility, and there will be an option for a fixed increase in total enrollment if necessary to augment the statistical power of the trial. This Phase 3 clinical trial design builds on insights gained from FORTITUDE-ALS, further exploring the hypothesis that fast skeletal muscle activation with reldesemtiv may be an important therapeutic strategy in ALS.

On October 10, 2022, we announced that the DMC for COURAGE-ALS, recently convened to conduct the first planned interim analysis of this ongoing Phase 3 clinical trial which assessed for the potential of futility. The DMC reviewed unblinded data from COURAGE-ALS and recommended that conduct of the clinical trial of reldesemtiv continue. The first interim analysis was triggered twelve (12) weeks after approximately one-third or more of the intended number of patients were randomized to participate in COURAGE-ALS. A second interim analysis, which is anticipated to occur in the first half of next year, will also assess for potential futility and will also allow for a fixed increase in total enrollment, if deemed necessary, to augment the statistical power of the trial.

COURAGE-ALS OLE

COURAGE-ALS OLE is an open-label extension clinical study designed to assess the long-term safety and tolerability of reldesemtiv in people with ALS. Patients will be eligible for COURAGE-ALS OLE after completing their participation in COURAGE-ALS. COURAGE-ALS OLE is currently enrolling patients.

Astellas Revenue Interest

Reldesemtiv was developed as part of our previous collaboration with Astellas. Under our Fast Skeletal Regulatory Activator Agreement with Astellas, which we refer to as the Astellas FSRA Agreement, Astellas agreed to pay one-third of the out-of-pocket clinical development costs which may be incurred in connection with our Phase 3 clinical trial of reldesemtiv in ALS, up to a maximum contribution by Astellas of $12 million. In exchange, we will pay Astellas a low- to mid- single digit royalty on sales of reldesemtiv in the United States, Canada, United Kingdom and the E.U. until the later of (i) ten years following the first commercial sale of such product in a major market country, or (ii) December 31, 2034, subject to certain royalty reduction provisions. We will not owe Astellas royalties on sales of reldesemtiv in any other country.

Ongoing Research in Skeletal Muscle Activators

We are conducting translational research in preclinical models of disease and muscle function with FSTAs to explore the potential clinical applications of this novel mechanism in diseases or conditions associated with skeletal muscle dysfunction.

Beyond Muscle Contractility

We developed preclinical expertise in the mechanics of skeletal, cardiac and smooth muscle that extends from proteins to tissues to intact animal models. Our translational research in muscle contractility has enabled us to better understand the potential impact of small molecule compounds that increase skeletal or cardiac muscle contractility and to apply those findings to the further evaluation of our drug candidates in clinical populations. In addition to contractility, other major functions of muscle play a role in certain diseases that could benefit from novel mechanism treatments. Accordingly, our knowledge of muscle contractility may serve as an entry point to the discovery of novel treatments for disorders involving muscle functions other than muscle contractility. We are leveraging our current understandings of muscle biology to investigate new ways of modulating these other aspects of muscle function for other potential therapeutic applications.

Manufacturing Resources and Product Supply

Our drug candidates require precise high-quality manufacturing that is compliant with good manufacturing processes (or foreign equivalent) and other applicable laws. We have no manufacturing capabilities and rely on third party sources for the supply or sourcing of raw materials, the manufacture of active pharmaceutical ingredients and the manufacture and packaging of finished drug products for both clinical trial materials and commercial supply.

We have established relationships with leading contract manufacturers in North America and Western Europe for the manufacture and supply of active pharmaceutical ingredients and finished drug product for use in our clinical trials. Clinical trial materials sourced from contract manufacturers generally have longer lead times than commercial product, have a higher cost per unit as a result of smaller batch sizes, and may be more difficult to manufacture to necessary specifications. As a result, we endeavor to seek contract manufacturers with proven manufacturing capabilities and quality standards whom we can rely on for timely supply. For our portfolio of small molecules, we continue to expand our network through well-established and reputable third-party contract manufacturers for our CMC development and manufacturing that have good regulatory standing, suitable manufacturing capabilities and capacities. These third parties must comply with applicable regulatory requirements, including FDA's cGMP, the E.U.'s Guidelines on Good Distribution Practice (cGDP), as well as other stringent regulatory requirements enforced by the FDA or foreign regulatory agencies, as applicable, and are subject to routine inspections by such regulatory agencies. In addition, through our third-party contract manufacturers and data service providers, we continue to provide serialized commercial products as required to comply with the Drug Supply Chain Security Act.

We monitor and evaluate the performance of our third-party contract manufacturers on an ongoing basis for compliance with these requirements and to affirm their continuing capabilities to meet both our commercial and clinical needs. We employ highly skilled personnel with both technical and manufacturing experience to diligently manage the activities at our third-party contract manufacturers and other supply chain partners, and our quality department audits them on a periodic basis.

In the event any of our drug candidates were to be approved for commercial marketing by the FDA or any other regulatory authorities, we would need to enter into contractual arrangements with contract manufacturers for the manufacture of active pharmaceutical ingredients and packaging of finished drug product for commercial use.

We have contract manufacturing arrangements in place with leading contract manufacturers for the development and supply of the active pharmaceutical ingredient and finished drug product for aficamten and reldesemtiv for use in our clinical trials, including SEQUOIA-HCM and COURAGE-ALS.

Competition

There are many companies focused on the development of small molecules for the treatment HFrEF, HCM, ALS and other diseases that our drugs are intended to treat. Our competitors and potential competitors include major pharmaceutical and biotechnology companies, as well as academic research institutions, clinical reference laboratories and government agencies that are pursuing research activities similar to ours. Many of the organizations competing with us have greater capital resources, larger research and development staff and facilities, deeper regulatory expertise and more extensive product manufacturing and commercial capabilities than we do, which may afford them a competitive advantage.

Competition for Omecamtiv Mecarbil

We believe the principal competition for omecamtiv mecarbil, if ultimately approved for sales and marketing by FDA and/or other regulatory agencies for the treatment of HFrEF includes generic drugs, such as milrinone, dobutamine or digoxin, categories of generic therapies, including beta-blockers, angiotensin-converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs), Mineralocorticoid receptor antagonists (MRAs), and branded drugs such as CORLANOR® (ivabradine), ENTRESTO® (sacubitril/valsartan) and VERQUVO® (vericiguat). omecamtiv mecarbil could also potentially compete against other novel drug candidates and therapies in development, such as those being developed by, but not limited to, Novartis AG, Merck & Co., Inc., Bayer AG, AstraZeneca PLC and Bristol-Myers Squibb Company. omecamtiv mecarbil may also compete with currently approved drugs, such as in the SGLT2 inhibitor class, that have either expanded or are planning to expand their labels to include treatment of patients with heart failure, including FORXIGA® (dapagliflozin), INVOKANA® (canagliflozin), and JARDIANCE® (empagliflozin). The competitive landscape for HFrEF is already crowded and evolving rapidly, especially given the addition of SGLT2 inhibitors as AHA/ACC/HFSA guideline directed medical therapy for HFrEF. SGLT2 inhibitors have steadily gained market share over the previous two years. In addition, there are a number of medical devices both marketed and in development for the potential treatment of patients living with heart failure.

We believe that our ability to successfully compete will depend on, among other things:

- efficacy, safety and reliability of omecamtiv mecarbil, both alone and in combination with other therapies;
- the timing and scope of regulatory approval;
- our ability to manufacture and sell commercial quantities of omecamtiv mecarbil product to the market;
- our ability to successfully commercialize omecamtiv mecarbil and secure coverage and adequate reimbursement with affordable patient copay in approved indications;
- product acceptance by physicians and other health care providers;
- if required in connection to regulatory approval by FDA and/or other regulatory authorities, the availability of an antibody-based immunoassay to timely and properly perform blood tests for omecamtiv mecarbil concentration levels on patients to whom omecamtiv mecarbil is prescribed;
- price competition, particularly of generic products;
- protection of our intellectual property, including our ability to enforce our intellectual property rights against potential generic competition; and
- the availability of substantial capital resources to fund development and commercialization activities.

Competition for Aficamten

If aficamten is approved for sales and marketing by the FDA or other regulatory authorities for the treatment of HCM, we believe it will likely compete with CAMZYOS™ (mavacamten), a first in class cardiac myosin inhibitor marketed by Bristol Myers Squibb. In addition to CAMZYOS™, other companies, including but not limited to Novartis AG, Eli Lilly, Boehringer Ingelheim, Gilead, Edgewise Therapeutics, Imbria and Tenaya Therapeutics, are conducting clinical trials and pre-clinical activities in HCM and could complete with aficamten.

As a condition to its FDA approval, CAMZYOS™ is subject to a REMS program that may be slowing its market uptake. We cannot predict whether FDA will impose a similar REMS program as a condition to a potential, future approval of aficamten or whether the FDA will alter or lessen the REMS program for CAMZYOS™ altering the competitive landscape. Despite the challenges associated with a REMS program, Bristol Myers Squibb has been able to enroll many physicians in its training program and has been able to start new patients on therapy. We expect that this will increase over time with more experience with this class of drugs.

We believe that our ability to successfully compete will depend on, among other things:

- efficacy, safety and reliability of aficamten, both alone and in combination with other therapies;
- the timing and scope of regulatory approval;
- our ability to complete clinical development and obtain regulatory approval for aficamten;
- the imposition by FDA or other regulatory authorities of a REMS program that is less burdensome to healthcare providers and patients than the REMS program that CAMZYOS™ is subject to;
- our ability to manufacture and sell commercial quantities of aficamten product to the market;
- our ability to successfully commercialize aficamten and secure coverage and adequate reimbursement in approved indications;
- product acceptance by physicians and other health care providers;
- protection of our intellectual property, including our ability to enforce our intellectual property rights against potential generic competition; and
- the availability of substantial capital resources to fund development and commercialization activities.

Competition for Reldesemtiv

If reldesemtiv is approved for sales and marketing by the FDA or other regulatory authorities for the treatment of ALS, we believe it will likely compete with RADICAVA™ (edaravone), marketed by Mitsubishi Tanabe Pharma Corporation, and RELYVRIO™ (AMX0035), marketed by Amylyx Pharmaceuticals. These are the first two FDA approved drugs for the treatment of ALS since riluzole in 1995. In addition, we may then also compete with other potential new therapies for ALS that are currently being developed by companies including, but not limited to, AB Science, AKAVA Therapeutics, Alexion Pharmaceuticals, BrainStorm Cell Therapeutics, Biogen, Biohaven Pharmaceuticals, Ferrer, Ionis, Medicinova, Inc., Orphazyme, Revalesio Corporation and Seelos Therapeutics. The dearth of approved products and the remaining significant unmet need in ALS has created a strong demand within the ALS community for additional new therapies that slow the decline in the disease or maintain the function of patients living with this disease. Therefore, we have seen a trend of significant new patient starts for new therapies that become approved.

We believe that our ability to successfully compete will depend on, among other things:

- efficacy, safety and reliability of reldesemtiv, both alone and in combination with other therapies;
- the timing and scope of regulatory approval;
- our ability to complete clinical development and obtain regulatory approval for reldesemtiv;
- our ability to manufacture and sell commercial quantities of reldesemtiv product to the market;
- our ability to successfully commercialize reldesemtiv and secure coverage and adequate reimbursement in approved indications;
- product acceptance by physicians and other health care providers;
- protection of our intellectual property, including our ability to enforce our intellectual property rights against potential generic competition; and
- the availability of substantial capital resources to fund development and commercialization activities.

Intellectual Property Resources

Our policy is to seek patent protection for the technologies, inventions and improvements that we develop that we consider important to the advancement of our business. As of December 31, 2022, we owned, co-owned or licensed 73 issued U.S. patents, over 650 issued patents in various foreign jurisdictions, and over 430 additional pending U.S. and foreign patent applications. We also rely on trade secrets, technical know-how and continuing innovation to develop and maintain our competitive position. Our commercial success will depend on obtaining and maintaining patent protection and trade secret protection for our drug candidates and technologies and our successfully defending these patents against third-party challenges. We will only be able to protect our technologies from unauthorized use by third parties to the extent that valid and enforceable patents cover them or we maintain them as trade secrets.

With regard to our drug candidates directed to muscle biology targets, we have a U.S. patent covering omecamtiv mecarbil, U.S. patents covering our skeletal muscle sarcomere activators including, but not limited to reldesemtiv, and a U.S. patent covering aficamten, which expire in 2027, 2031 and 2039, respectively, unless extended or otherwise adjusted. We also have issued patents in various foreign jurisdictions and additional U.S. and foreign patent applications pending for these drug candidates. It is not known or determinable whether other patents will issue from any of our other pending applications or what the expiration dates would be for any other patents that do issue.

In relation to our collaborations, our partners may develop or have developed, solely or with us, intellectual property rights in connection with our drug candidates. Our collaboration agreements generally contain provisions regarding ownership, prosecution and maintenance, assignment and license rights to enable us to protect and benefit from intellectual property rights that are developed with or by our partners.

Our drug candidates are still in clinical development and have not yet been approved by the FDA. If any of these drug candidates are approved, then pursuant to federal law, we may apply for an extension of the U.S. patent term for one patent covering the approved drug, which could extend the term of the applicable patent by up to a maximum of five additional years.

The degree of future protection of our proprietary rights is uncertain because legal means may not adequately protect our rights or permit us to gain or keep our competitive advantage. Due to evolving legal standards relating to the patentability, validity and enforceability of patents covering pharmaceutical inventions and the claim scope of these patents, our ability to enforce our existing patents and to obtain and enforce patents that may issue from any pending or future patent applications is uncertain and involves complex legal, scientific and factual questions. The standards that the U.S. Patent and Trademark Office and its foreign counterparts use to grant patents are not always applied predictably or uniformly and are subject to change. To date, no consistent policy has emerged regarding the breadth of claims allowed in biotechnology and pharmaceutical patents. Thus, we cannot be sure that any patents will issue from any pending or future patent applications owned by, co-owned by, or licensed to us. Even if patents do issue, we cannot be sure that the claims of these patents will be held valid or enforceable by a court of law, will provide us with any significant protection against competitive products, or will afford us a commercial advantage over competitive products. For example:

- we or our licensors might not have been the first to make the inventions covered by each of our pending patent applications or issued patents;
- we or our licensors might not have been the first to file patent applications for the inventions covered by our pending patent applications or issued patents;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- some or all of our or our licensors' pending patent applications may not result in issued patents or the claims that issue may be narrow in scope and not provide us with competitive advantages;
- our and our licensors' issued patents may not provide a basis for commercially viable drugs or therapies or may be challenged and invalidated by third parties;
- our or our licensors' patent applications or patents may be subject to interference, post-grant proceedings, opposition or similar legal and administrative proceedings that may result in a reduction in their scope or their loss altogether;
- we may not develop additional proprietary technologies or drug candidates that are patentable; or
- the patents of others may prevent us or our partners from discovering, developing or commercializing our drug candidates.

The defense and prosecution of intellectual property infringement suits, interferences, post-grant proceedings, oppositions and related legal and administrative proceedings are costly, time-consuming to pursue and divert resources. The outcome of these types of proceedings is uncertain and could significantly harm our business. For example, an unknown third party has filed an opposition against a granted European patent relating to compositions of omecamtiv mecarbil. Although we are defending the patent, we cannot be certain that the patent will be upheld as valid. If our European patent is invalidated, our intellectual property position in Europe could be weakened and it could have a negative impact on our business.

Our ability to commercialize drugs depends on our ability to use, manufacture and sell those drugs without infringing the patents or other proprietary rights of third parties. U.S. and foreign issued patents and pending patent applications owned by third parties exist that may be relevant to the therapeutic areas and chemical compositions of our drug candidates. While we are aware of certain relevant patents and patent applications owned by third parties, there may be issued patents or pending applications of which we are not aware that could cover our drug candidates. Because patent applications are often not published immediately after filing, there may be currently pending applications, unknown to us, which could later result in issued patents that our activities with our drug candidates could infringe.

The development of our drug candidates and the commercialization of any resulting drugs may be impacted by patents of companies engaged in competitive programs with significantly greater resources. This could result in the expenditure of significant legal fees and management resources.

We also rely on trade secrets to protect our technology, especially where we do not believe patent protection is appropriate or obtainable. However, trade secrets are often difficult to protect, especially outside of the United States. While we believe that we use reasonable efforts to protect our trade secrets, our employees, consultants, contractors, partners and other advisors may unintentionally or willfully disclose our trade secrets to competitors. Enforcing a claim that a third party had illegally obtained and is using our trade secrets would be expensive and time-consuming, and the outcome would be unpredictable. Even if we are able to maintain our trade secrets as confidential, our competitors may independently develop information that is equivalent or similar to our trade secrets.

We seek to protect our intellectual property by requiring our employees, consultants, contractors and other advisors to execute nondisclosure and invention assignment agreements upon commencement of their employment or engagement, through which we seek to protect our intellectual property. Agreements with our employees also preclude them from bringing the proprietary information or materials of third parties to us. We also require confidentiality agreements or material transfer agreements from third parties that receive our confidential information or materials.

For further details on the risks relating to our intellectual property, please see the risk factors under Item 1A of this report, including, but not limited to, the risk factors entitled "Our success depends substantially upon our ability to obtain and maintain intellectual property protection relating to our drug candidates and research technologies" and "If we are sued for infringing third-party intellectual property rights, it will be costly and time-consuming, and an unfavorable outcome would have a significant adverse effect on our business."

Compliance with Government Regulation

The FDA and comparable regulatory agencies in state and local jurisdictions and in foreign countries impose substantial requirements upon the clinical development, manufacture, marketing and distribution of drugs. These agencies and other federal, state and local entities regulate research and development activities and the testing, manufacture, quality control, labeling, storage, record keeping, approval, advertising and promotion of our drug candidates and drugs.

In the United States, the FDA regulates drugs under the Federal Food, Drug and Cosmetic Act and implementing regulations. The process required by the FDA before our drug candidates may be marketed in the United States generally involves the following:

- completion of extensive preclinical laboratory tests, preclinical animal studies and formulation studies, all performed in accordance with the FDA's good laboratory practice regulations;
- submission to the FDA of an IND, which must become effective before clinical trials may begin;
- performance of adequate and well-controlled clinical trials to establish the safety and efficacy of the drug candidate for each proposed indication in accordance with GCP;
- submission of a NDA to the FDA, which must usually be accompanied by payment of a substantial user fee;
- satisfactory completion of an FDA preapproval inspection of the manufacturing facilities at which the product is produced to assess compliance with cGMP regulations and FDA audits of select clinical investigator sites to assess compliance with GCP; and
- FDA review and approval of the NDA prior to any commercial marketing, sale or shipment of the drug.

Similar regulatory procedures generally apply in countries outside of the United States. This testing and approval process requires substantial time, effort and financial resources, and we cannot be certain that any approvals for our drug candidates will be granted on a timely basis, if at all.

Non-clinical tests include laboratory evaluation of product chemistry, formulation and stability, and studies to evaluate toxicity and pharmacokinetics in animals. The results of non-clinical tests, together with manufacturing information and analytical data, are submitted as part of an IND application to the FDA. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA, within the 30-day period, raises concerns or questions about the conduct of the proposed clinical trial, including concerns that human research subjects may be exposed to unreasonable health risks. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. Our submission of an IND or a foreign equivalent, or those of our collaborators, may not result in authorization from the FDA or its foreign equivalent to commence a clinical trial. A separate submission to an existing IND must also be made for each successive clinical trial conducted during product development. Further, an independent IRB or its foreign equivalent for each medical center proposing to conduct the clinical trial must review and approve the plan for any clinical trial before it commences at that center and it must monitor the clinical trial until completed. The FDA, the IRB or their foreign equivalents, or the clinical trial sponsor may suspend a clinical trial at any time on various grounds, including a finding that the subjects or patients are being exposed to an unacceptable health risk.

Clinical Trials. For purposes of an NDA or equivalent submission and approval, clinical trials are typically conducted in the following three sequential phases, which may overlap:

- *Phase 1:* Phase 1 trials include the initial introduction of a drug candidate into humans. These studies may be conducted in patients, but are usually conducted in healthy volunteer subjects. These studies are designed to determine the metabolic and pharmacologic actions of the drug candidate in humans, the side effects associated with increasing doses, and, if possible, to gain early evidence on effectiveness.
- *Phase 2:* Phase 2 trials include the early controlled clinical studies conducted to obtain some preliminary data on the effectiveness of the drug candidate for a particular indication or indications in patients with the disease or condition. This phase of testing also helps determine the common short-term side effects and risks associated with the drug candidate. These clinical trials are generally conducted in a limited patient population to identify possible adverse effects and safety risks, to make an initial determination of potential efficacy of the drug candidate for specific targeted indications and to determine dose tolerance and optimal dosage. Multiple Phase 2 clinical trials may be conducted by the sponsor to obtain information prior to beginning larger and more expensive Phase 3 clinical trials. Phase 2a clinical trials generally are designed to study the pharmacokinetic or pharmacodynamic properties and to conduct a preliminary assessment of safety of the drug candidate over a measured dose response range. In some cases, a sponsor may decide to conduct a Phase 2b clinical trial, which is a second, typically larger, confirmatory Phase 2 trial that could, if positive and accepted by a regulatory authority, support approval of a drug candidate.
- *Phase 3:* Phase 3 clinical trials are then undertaken in large patient populations to further evaluate dosage, to provide substantial evidence of clinical efficacy and to further test for safety in an expanded and diverse patient population at multiple, geographically dispersed clinical trial sites. Phase 3 trials are also intended to provide an adequate basis for extrapolating the results to the general population and transmitting that information in the drug labeling. Phase 3 studies usually include several hundred to several thousand people, and are usually longer in duration than Phase 2 trials.

At any time during the conduct of a clinical trial, the FDA or a foreign equivalent can impose a clinical hold on the trial if it believes the trial is unsafe or that the protocol is clearly deficient in design in meeting its stated objectives, which requires the conduct of the trial to cease until the clinical hold is removed. In some cases, the FDA or foreign equivalent may condition approval of marketing approval for a drug candidate on the sponsor's agreement to conduct additional clinical trials to further assess the drug's safety and effectiveness after marketing approval, known as Phase 4 clinical trials.

The clinical trials we conduct for our drug candidates, both before and after approval, and the results of those trials, are generally required to be included in a clinical trials registry database that is available and accessible to the public via the internet. A failure by us to properly participate in the clinical trial database registry could subject us to significant civil monetary penalties.

Health care providers in the United States, including research institutions from which we or our partners obtain patient information, are subject to privacy rules under the Health Insurance Portability and Accountability Act of 1996 and state and local privacy laws. In the E.U., these entities are subject to the Directive 95/46-EC of the European Parliament on the protection of individuals with regard to the processing of personal data and individual E.U. member states implementing additional legislation. The General Data Protection Regulation (E.U.) 2016/679 is a regulation in E.U. law on data protection and privacy for all individuals within the E.U. and the EEA. Other countries have similar privacy legislation. We could face substantial penalties if we knowingly receive individually identifiable health information from a health care provider that has not satisfied the applicable privacy laws. In addition, certain privacy laws and genetic testing laws may apply directly to our operations and/or those of our partners and may impose restrictions on the use and dissemination of individuals' health information and use of biological samples.

New Drug/Marketing Approval Application. The results of drug candidate development, preclinical testing and clinical trials are submitted to the FDA as part of an NDA. The NDA also must contain extensive manufacturing information. In addition, the FDA may require that a proposed REMS, be submitted as part of the NDA if the FDA determines that it is necessary to ensure that the benefits of the drug outweigh its risks. Similar, and in some cases additional, requirements apply in foreign jurisdictions for marketing approval applications for drugs in those jurisdictions. The FDA may refer the NDA to an advisory committee for review, evaluation and recommendation as to whether the application should be approved. The FDA often, but not always, follows the advisory committee's recommendations. The FDA may also require preapproval inspections of manufacturing operations and clinical trial sites during the course of NDA review, and findings arising from any of these inspections may delay or prevent the approval of the NDA. The FDA may deny approval of an NDA by issuing a CRL if the applicable regulatory criteria are not satisfied, or it may require additional clinical data, including data in a pediatric population, or an additional Phase 3 clinical trial or impose other conditions that must be met in order to secure final approval for an NDA.

Even if such data are submitted, the FDA may ultimately decide that the NDA does not satisfy the criteria for approval. Data from clinical trials are not always conclusive and the FDA may interpret data differently than we or our partners do. Once issued, the FDA or foreign equivalent may withdraw a drug approval if ongoing regulatory requirements are not met or if safety problems occur after the drug reaches the market. In addition, the FDA or its foreign counterparts may require further testing, including Phase 4 clinical trials, and surveillance or restrictive distribution programs to monitor the effect of approved drugs which have been commercialized. The FDA and its foreign counterparts have the power to prevent or limit further marketing of a drug based on the results of these post-marketing programs. Drugs may be marketed only for the approved indications and in accordance with the provisions of the approved label. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label may be subject to significant liability. However, physicians may, in their independent medical judgment, prescribe legally available products for off-label uses. The FDA does not regulate the behavior of physicians in their choice of treatments but the FDA does restrict manufacturer's communications on the subject of off-label use of their products. Further, if there are any modifications to a drug, including changes in indications, labeling or manufacturing processes or facilities, we may be required to submit and obtain prior FDA approval of a new NDA or NDA supplement, or the foreign equivalent, which may require us to develop additional data or conduct additional preclinical studies and clinical trials.

Satisfaction of FDA regulations and requirements or similar regulations and requirements of state, local and foreign regulatory agencies typically takes several years. The actual time required may vary substantially based upon the type, complexity and novelty of the drug candidate or disease. Government regulation may delay or prevent marketing of drug candidates for a considerable period of time and impose costly procedures upon our activities. The FDA or any other regulatory agency may not grant approvals for new indications for our drug candidates on a timely basis, if at all. Even if a drug candidate receives regulatory approval, the approval may be significantly limited to specific disease states, patient populations and dosages or restrictive distribution programs. Further, even after regulatory approval is obtained, later discovery of previously unknown problems with a drug may result in restrictions on the drug or even complete withdrawal of the drug from the market. Delays in obtaining, or failures to obtain, regulatory approvals for any of our drug candidates would harm our business. In addition, we cannot predict what future U.S. or foreign governmental regulations may be implemented.

Orphan Drug Designation. Some jurisdictions, including the United States, may designate drugs for relatively small patient populations as orphan drugs. The FDA grants orphan drug designation to drugs intended to treat a rare disease or condition, which is generally a disease or condition that affects fewer than 200,000 individuals in the United States.

An FDA orphan drug designation does not shorten the duration of the regulatory review and approval process. If a drug candidate that has an orphan drug designation receives the first FDA marketing approval for the indication for which the designation was granted, then the approved drug is entitled to orphan drug exclusivity. This means that the FDA may not approve another company's application to market the same drug for the same indication for a period of seven years, except in certain circumstances, such as a showing of clinical superiority to the drug with orphan exclusivity or if the holder of the orphan drug designation cannot assure the availability of sufficient quantities of the orphan drug to meet the needs of patients with the disease or condition for which the designation was granted. Competitors may receive approval of different drugs or biologics for the indications for which the orphan drug has exclusivity.

Special Protocol Assessment. A sponsor may request an SPA agreement with FDA on the Phase 3 clinical trial protocol design and analysis that will form the primary basis of an efficacy claim. Even if the FDA agrees to the design, execution and analyses proposed in protocols reviewed under the SPA process, the FDA may revoke or alter its agreement if public health concerns emerge that were unrecognized at the time of the SPA agreement, or a substantial scientific issue essential to determining safety or efficacy is identified after testing has begun. An SPA does not guarantee that an NDA will be approved.

Other Regulatory Requirements. Any drugs manufactured or distributed by us or our partners pursuant to FDA approvals or their foreign counterparts are subject to continuing regulation by the applicable regulatory authority, including recordkeeping requirements and reporting of adverse experiences associated with the drug. Drug manufacturers and their subcontractors are required to register their establishments with the FDA and other applicable regulatory authorities, and are subject to periodic unannounced inspections by these regulatory authorities for compliance with ongoing regulatory requirements, including cGMPs, which impose certain procedural and documentation requirements upon us and our third-party manufacturers. Failure to comply with the statutory and regulatory requirements can subject a manufacturer to possible legal or regulatory action, such as warning letters, suspension of manufacturing, seizure of product, injunctive action or possible civil penalties. We cannot be certain that we or our present or future third-party manufacturers or suppliers will be able to comply with the cGMP regulations and other ongoing FDA and other regulatory requirements. If our present or future third-party manufacturers or suppliers are not able to comply with these requirements, the FDA or its foreign counterparts may halt our or our partners' clinical trials, require us to recall a drug from distribution, or withdraw approval of the NDA for that drug.

For further details on the risks relating to government regulation of our business, please see the risk factors under Item 1A of this report, including, but not limited to, the risk factor entitled "The regulatory approval process is expensive, time-consuming and uncertain and may prevent our partners or us from obtaining approvals to commercialize some or all of our drug candidates."

Other Healthcare Laws. We are currently or will in the future be subject to healthcare regulation and enforcement by the federal government and the states in which we will conduct our business once our product candidates are approved by the FDA and commercialized in the United States. In addition to the FDA's restrictions on marketing of pharmaceutical products, the U.S. healthcare laws and regulations that may affect our ability to operate include: the federal fraud and abuse laws, including the federal anti-kickback and false claims laws; federal data privacy and security laws; and federal transparency laws related to payments and/or other transfers of value made to physicians and other healthcare professionals and teaching hospitals. Many states have similar laws and regulations that may differ from each other and federal law in significant ways, thus complicating compliance efforts. For example, states have anti-kickback and false claims laws that may be broader in scope than analogous federal laws and may apply regardless of payer. In addition, state data privacy laws that protect the security of health information may differ from each other and may not be preempted by federal law. Moreover, several states have enacted legislation requiring pharmaceutical manufacturers to, among other things, establish marketing compliance programs, file periodic reports with the state, make periodic public disclosures on sales and marketing activities, report information related to drug pricing, require the registration of sales representatives, and prohibit certain other sales and marketing practices. If our operations are found to be in violation of these laws, we may be subject to significant civil, criminal, and administrative penalties, including, without limitation, damages, fines, imprisonment, exclusion from participation in government healthcare programs, additional reporting obligations and oversight if we become subject to a corporate integrity agreement or other agreement to resolve allegations of non-compliance with these laws, and the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

Health Care Reform. Additionally, in the United States and some foreign jurisdictions there have been, and continue to be, several legislative and regulatory changes and proposed reforms of the healthcare system in an effort to contain costs, improve quality, and expand access to care. These reform initiatives may, among other things, result in modifications to the aforementioned laws and/or the implementation of new laws affecting the healthcare industry. In particular, in March 2010, the ACA, was enacted, which substantially changed the way health care is financed by both governmental and private insurers, and continues to significantly impact the U.S. pharmaceutical industry. Similarly, a significant trend in the healthcare industry is cost containment. Third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Moreover, in the United States, there have been several recent Congressional inquiries, presidential executive orders and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. For example, in August 2022, the IRA was signed into law, which, among other things, includes prescription drug provisions that may impact product pricing including the potential for net price reductions and/or the ability to increase price beyond the level of inflation over the lifecycle of our products, and/or may increase our rebate obligation to Medicare. Provisions include a requirement that the HHS negotiate drug prices for single-source brand-name drugs and biologics that are among the 50 drugs with the highest total Medicare Part D spending. The law establishes a maximum fair price, outlines the process by which the Secretary of HHS will identify drugs for negotiations, and establishes non-compliance penalties for manufacturers. The Act implements inflation rebates in Medicare when a drug's Average Manufacturer Price (AMP, in Part D) or Average Sale Price (ASP, in Part B) rises faster than the inflation index (CPI-U). In addition, the Part D drug benefit caps beneficiary spending at $2,000, eliminates the coverage gap for patients, and modifies, beginning in 2025, liabilities for drug manufacturers by replacing the 70% discount in the Coverage gap with a 10% discount in the Initial Coverage phase and a 20% discount in the Catastrophic phase. Further, the Biden administration released an additional executive order on October 14, 2022, directing HHS to report on how the Center for Medicare and Medicaid Innovation can be further leveraged to test new models for lowering drug costs for Medicare and Medicaid beneficiaries.

Coverage and Reimbursement. Our ability to commercialize any of our products successfully will depend in part on the extent to which coverage and adequate reimbursement for these products and will be available from third-party payors. Even if we obtain coverage for a given drug product, the associated reimbursement rate may not be adequate to cover our costs, including research, development, intellectual property, manufacture, sale and distribution expenses, or may require co-payments that patients find unacceptably high. Coverage and reimbursement policies for drug products can differ significantly from payor to payor as there is no uniform policy of coverage and reimbursement for drug products among third-party payors in the U.S. Reimbursement by a third-party payor may depend upon a number of factors, including the third-party payor's determination that a product is safe, effective and medically necessary; and neither cosmetic, experimental nor investigational. To support securing coverage and reimbursement for any product that might be approved for sale, we may need to conduct expensive pharmacoeconomic studies in order to demonstrate the medical necessity and cost-effectiveness of our approved products. There may be significant delays in obtaining coverage and reimbursement as the process of determining coverage and reimbursement is often time-consuming and costly. Further, coverage policies and third party reimbursement rates may change at any time.

Cytokinetics Human Capital

As of December 31, 2022, we had 409 employees and 167 consultants. 28 of those employees have more than 10 years tenure with us and 78 have over 5 years of service. In 2022, employee turnover was 9%, which we believe is a lower attrition rate compared to the industry.

We are committed to fostering and maintaining a culture that engenders collaboration and teamwork, inclusion, respect, transparency and candor. We provide our employees with an array of professional development resources and tools to support their learning, growth and development opportunities. We were honored to be recognized as a San Francisco Times Best Place to Work and Great Places to Work in 2022.

Our compensation and benefit programs are designed to enable us to attract and retain the best employees in a very competitive life science sector and regularly benchmark and survey the market to ensure we maintain competitive programs and ensuring employees receive equal pay for equal work. In addition, we routinely survey our employees to measure engagement, identify and take action on opportunities for improvement, and share these results with employees.

We have a rigorous annual goal setting and goal evaluation process under the supervision of our Board of Directors and senior management to assist our employees in understanding what is expected of them individually and as an organization.

We are going into our third year of implementing a Diversity, Equity, Inclusion and Respect program and are fully committed across all aspects of our organization including recruiting and hiring, development and promotion practices. Employees identifying as ethnic or racial minorities held 43% of director-level and above positions. Employees identifying as women held 44% of director-level and above positions.

Our Compensation and Talent Committee of the Board of Directors reviews employee engagement, reward programs, human resource metrics, including attrition, retention and staffing on an on-going basis.

COVID-19 Business Update

We are continuing to closely monitor the impact of the global COVID-19 pandemic on our business and continue to take proactive efforts designed to protect the health and safety of our employees, patients, study investigators and clinical research staff, and to maintain business continuity. We believe that the measures we are implementing are appropriate and are helping to reduce the transmission of COVID-19, and we will continue to monitor and seek to comply with guidance from governmental authorities and adjust our activities as appropriate.

In the conduct of our business activities, we are taking actions designed to protect the safety of patients and healthcare professionals. For patients already enrolled in our clinical trials, we and our partners are working closely with study investigators and clinical trial site staff to continue treatment in compliance with trial protocols and to uphold trial integrity, while working to observe government and institutional guidelines designed to safeguard the health and safety of patients and site staff.

While the potential economic impact brought by, and the duration of, the COVID-19 pandemic may be difficult to assess or predict, the pandemic could result in significant and prolonged disruption of global financial markets, reducing our ability to access capital, which could in the future negatively affect our liquidity. In addition, a recession or market correction resulting from the spread of COVID-19 could materially affect our business and the value of our common stock.

While we expect the COVID-19 pandemic to continue to affect our business operations, the extent of the impact on our clinical development and regulatory efforts and 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 of the pandemic, travel restrictions, quarantines, social distancing and business closure requirements in the U.S. and in other countries, and the effectiveness of actions taken globally to contain and treat COVID-19. For additional information about risks and uncertainties related to the COVID-19 pandemic that may impact our business, our financial condition and our results of operations, see the section titled “Risk Factors” under Part I, Item 1A in this Annual Report on Form 10-K.

Investor Information

We file electronically with the SEC our annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K pursuant to Section 13 or 15(d) of the Exchange Act. The SEC maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC. The address of that site is www.sec.gov.

You may obtain a free copy of our annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K and amendments to those reports on the day of filing with the SEC on our website at www.cytokinetics.com or by contacting the Investor Relations Department at our corporate offices by calling 650-624-3060. The information found on our website is not part of this or any other report filed with or furnished to the SEC.

ITEM 1A. RISK FACTORS

In evaluating our business, you should carefully consider the following risks in addition to the other information in this report. Any of the following risks could materially and adversely affect our business, results of operations, financial condition or your investment in our securities, and many are beyond our control. The risks and uncertainties described below are not the only ones facing us. Additional risks and uncertainties not presently known to us, or that we currently see as immaterial, may also adversely affect our business.

Risks Specific to our Company in connection with our Research and Development Activities

We recently received a CRL from FDA in response to our NDA for omecamtiv mecarbil. The CRL stated that results from an additional clinical trial of omecamtiv mecarbil are required to establish substantial evidence of effectiveness for the treatment of HFrEF, with benefits that outweigh the risks. No assurance can be given that we will be able to address any of the deficiencies noted in the CRL and/or obtain FDA approval of our NDA for omecamtiv mecarbil.

On February 28, 2023, we announced that we received a CRL from the FDA's Division of Cardiology and Nephrology regarding our NDA for omecamtiv mecarbil for the treatment of HFrEF. According to the CRL, GALACTIC-HF is not sufficiently persuasive to establish substantial evidence of effectiveness for reducing the risk of heart failure events and cardiovascular death in adults with chronic heart failure with HFrEF, in lieu of evidence from at least two adequate and well-controlled clinical investigations. In addition, FDA stated that results from an additional clinical trial of omecamtiv mecarbil are required to establish substantial evidence of effectiveness for the treatment of HFrEF, with benefits that outweigh the risks. FDA's decision to issue a CRL follows an FDA Cardiovascular and Renal Drugs Advisory Committee's vote of 8 to 3 in December 2022 that the benefits of omecamtiv mecarbil do not outweigh its risks for the treatment of HFrEF.

We expect to request a meeting with FDA in order to understand FDA's views regarding the CRL and what may be required to support potential approval of omecamtiv mecarbil in the United States. However, we have no plans to conduct an additional clinical trial of omecamtiv mecarbil. No assurance can be given that we will be able to address any of the deficiencies noted in the CRL and/or obtain FDA approval of our NDA for omecamtiv mecarbil.

Clinical trials may fail to demonstrate the desired safety and efficacy of our drug candidates, including aficamten and reldesemtiv, which could prevent or significantly delay completion of clinical development and regulatory approval.

Prior to receiving approval to commercialize any of our drug candidates, we or our partners must adequately demonstrate to the satisfaction of FDA and foreign regulatory authorities that the drug candidate is sufficiently safe and effective with substantial evidence from well-controlled clinical trials. We or our partners will need to demonstrate efficacy in clinical trials for the treatment of specific indications and monitor safety throughout the clinical development process and following approval. None of our drug candidates have yet met the safety and efficacy standards required for regulatory approval for commercialization and they may never do so. For example, the CRL we received on February 28, 2023 in connection to our NDA for omecamtiv mecarbil stated the results of GALACTIC-HF are not sufficiently persuasive to establish substantial evidence of effectiveness for reducing the risk of heart failure events and cardiovascular death in adults with chronic heart failure with HFrEF.

In addition, for each of our preclinical compounds, we or our partners must adequately demonstrate satisfactory chemistry, formulation, quality, stability and toxicity in order to submit an IND to the FDA, or an equivalent application in foreign jurisdictions, that would allow us to advance that compound into clinical trials. Furthermore, we or our partners may need to submit separate INDs (or foreign equivalent) to different divisions within the FDA (or foreign regulatory authorities) in order to pursue clinical trials in different therapeutic areas. Each new IND (or foreign equivalent) must be reviewed by the new regulatory division before the clinical trial under its jurisdiction can proceed, entailing all the risks of delay inherent to regulatory review. If our or our partners' current or future preclinical studies or clinical trials are unsuccessful, our business will be significantly harmed and our stock price could be negatively affected.

All of our drug candidates are prone to the risks of failure inherent in drug development. Preclinical studies may not yield results that would adequately support the filing of an IND (or a foreign equivalent) with respect to our potential drug candidates. Even if the results of preclinical studies for a drug candidate are sufficient to support such a filing, the results of preclinical studies do not necessarily predict the results of clinical trials. As an example, because the physiology of animal species used in preclinical studies may vary substantially from other animal species and from humans, it may be difficult to assess with certainty whether a finding from a study in a particular animal species will result in similar findings in other animal species or in humans. For any of our drug candidates, the results from Phase 1 clinical trials in healthy volunteers and clinical results from Phase 1 and 2 trials in patients are not necessarily indicative of the results of later and larger clinical trials that are necessary to establish whether the drug candidate is safe and effective for the applicable indication. Likewise, interim results from a clinical trial may not be indicative of the final results from that trial, and results from early Phase 2 clinical trials may not be indicative of the results from later clinical trials.

In addition, while the clinical trials of our drug candidates are designed based on the available relevant information, such information may not accurately predict what actually occurs during the course of the trial itself, which may have consequences for the conduct of an ongoing clinical trial or for the eventual results of that trial. For example, the number of patients planned to be enrolled in a placebo-controlled clinical trial is determined in part by estimates relating to expected treatment effect and variability about the primary endpoint. These estimates are based upon earlier non-clinical and clinical studies of the drug candidate itself and clinical trials of other drugs thought to have similar effects in a similar patient population. If information gained during the conduct of the trial shows these estimates to be inaccurate, we may elect to adjust the enrollment accordingly, which may cause delays in completing the trial, additional expense or a statistical penalty to apply to the evaluation of the trial results.

Furthermore, in view of the uncertainties inherent in drug development, such clinical trials may not be designed with focus on indications, patient populations, dosing regimens, endpoints, safety, efficacy or pharmacokinetic parameters or other variables that will provide the necessary safety or efficacy data to support regulatory approval to commercialize the resulting drugs. Clinical trials of our drug candidates are designed based on guidance or advice from regulatory agencies, which is subject to change during the development of the drug candidate at any time. Such a change in a regulatory agency's guidance or advice may cause that agency to deem results from trials to be insufficient to support approval of the drug candidate and require further clinical trials of that drug candidate to be conducted. In addition, individual patient responses to the dose administered of a drug may vary in a manner that is difficult to predict. Also, the methods we select to assess particular safety, efficacy or pharmacokinetic parameters may not yield the same statistical precision in estimating our drug candidates' effects as may other methodologies. Even if we believe the data collected from clinical trials of our drug candidates are promising, these data may not be sufficient to support approval by the FDA or foreign regulatory authorities. Non-clinical and clinical data can be interpreted in different ways. Accordingly, the FDA or foreign regulatory authorities could interpret these data in different ways from us or our partners, which could delay, limit or prevent regulatory approval.

Furthermore, while planned interim analyses in clinical trials can enable early terminations for futility or for overwhelming efficacy, the timing, which can be based on accrual of events, enrollment or other factors, and the results of such analyses, is unpredictable.

Administering any of our drug candidates or potential drug candidates may produce undesirable side effects, also known as adverse events. Toxicities and adverse events observed in preclinical studies for some compounds in a particular research and development program may also occur in preclinical studies or clinical trials of other compounds from the same program. Potential toxicity issues may arise from the effects of the active pharmaceutical ingredient itself or from impurities or degradants that are present in the active pharmaceutical ingredient or could form over time in the formulated drug candidate or the active pharmaceutical ingredient. These toxicities or adverse events could delay or prevent the filing of an IND (or a foreign equivalent) with respect to our drug candidates or potential drug candidates or cause us, our partners or the FDA or foreign regulatory authorities to modify, suspend or terminate clinical trials with respect to any drug candidate at any time during the development program. Further, the administration of two or more drugs contemporaneously can lead to interactions between them, and our drug candidates may interact with other drugs that trial subjects are taking. If the adverse events are severe or frequent enough to outweigh the potential efficacy of a drug candidate, the FDA or other regulatory authorities could deny approval of that drug candidate for any or all targeted indications. Even if one or more of our drug candidates were approved for sale as drugs, the occurrence of even a limited number of adverse events or toxicities when used in large populations may cause the FDA or foreign regulatory authorities to impose restrictions on, or stop, the further marketing of those drugs. Indications of potential adverse events or toxicities which do not seem significant during the course of clinical trials may later turn out to actually constitute serious adverse events or toxicities when a drug is used in large populations or for extended periods of time.

We have observed certain adverse events in the clinical trials conducted with our drug candidates. Moreover, clinical trials of reldesemtiv and aficamten enroll patients who typically suffer from serious diseases which put them at increased risk of death. These patients may die while receiving our drug candidates. In such circumstances, it may not be possible to exclude with certainty a causal relationship to our drug candidate, even though the responsible clinical investigator may view such an event as not study drug-related.

Any failure or significant delay in completing preclinical studies or clinical trials for our drug candidates, or in receiving and maintaining regulatory approval for the sale of any resulting drugs, may significantly harm our business and negatively affect our stock price.

The regulatory approval process is expensive, time-consuming and uncertain and may prevent our partners or us from obtaining approvals to commercialize some or all of our drug candidates.

The research, testing, manufacturing, selling and marketing of drugs are subject to extensive regulation by the FDA and other regulatory authorities in the United States and other countries, and regulations differ from country to country. Neither we nor our partners are permitted to market our potential drugs in the United States until we receive approval of an NDA from the FDA. Neither we nor our partners have received NDA or other marketing approval for any of our drug candidates.

Obtaining NDA approval is a lengthy, expensive and uncertain process. In addition, failure to comply with FDA and other applicable foreign and U.S. regulatory requirements may subject us to administrative or judicially imposed sanctions. These include warning letters, civil and criminal penalties, injunctions, product seizure or detention, product recalls, total or partial suspension of production, and refusal to approve pending NDAs or supplements to approved NDAs.

Regulatory approval of an NDA or NDA supplement is never guaranteed, and the approval process typically takes several years and is extremely expensive. For example, our NDA for omecamtiv mecarbil for the treatment of HFrEF resulted in a CRL notwithstanding the fact that the GALACTIC-HF clinical trial of over 8,000 patients met its primary efficacy endpoint. The FDA and foreign regulatory agencies also have substantial discretion in the drug approval process, and the guidance and advice issued by such agencies is subject to change at any time. Despite the time and efforts exerted, failure can occur at any stage, and we may encounter problems that cause us to abandon clinical trials or to repeat or perform additional preclinical testing and clinical trials. For example, the CRL we received from FDA in connection with our NDA for omecamtiv mecarbil stated that results from an additional clinical trial of omecamtiv mecarbil are required to establish substantial evidence of effectiveness for the treatment of HFrEF, with benefits that outweigh the risks. The number and focus of preclinical studies and clinical trials that will be required for approval by the FDA and foreign regulatory agencies varies depending on the drug candidate, the disease or condition that the drug candidate is designed to address, and the regulations applicable to any particular drug candidate. In addition, the FDA may require that a proposed REMS be submitted as part of an NDA if the FDA determines that it is necessary to ensure that the benefits of the drug outweigh its risks. The FDA and foreign regulatory agencies can delay, limit or deny approval of a drug candidate for many reasons, including, but not limited to:

- they might determine that a drug candidate is not safe or effective;
- they might not find the data from non-clinical testing and clinical trials sufficient and could request that additional trials be performed;

- they might not approve our, our partner's or the contract manufacturer's processes or facilities; or
- they might change their approval policies or adopt new regulations.

Even if we receive regulatory approval to manufacture and sell a drug in a particular regulatory jurisdiction, other jurisdictions' regulatory authorities may not approve that drug for manufacture and sale. Moreover, the refusal of one regulatory authority to approve one of our drug candidates may influence the decision-making of another regulatory authority in a different jurisdiction in a manner that is adverse to us. For example, FDA's recent CRL in response to our NDA for omecamtiv mecarbil may influence EMA to decline to approve our MAA for omecamtiv mecarbil in the E.U. or other regulatory authorities in other jurisdictions to decline to approve our potential marketing applications for omecamtiv mecarbil in such other jurisdictions.

If we or our partners fail to receive and maintain regulatory approval for the sale of any drugs resulting from our drug candidates, it would significantly harm our business and negatively affect our stock price.

Our clinical trials are expensive, time-consuming and may be subject to delay.

Clinical trials are subject to rigorous regulatory requirements and are very expensive, difficult and time-consuming to design and implement. The length of time and number of trial sites and patients required for clinical trials vary substantially based on the type, complexity, novelty, intended use of the drug candidate and safety concerns. Clinical trials of our current drug candidates can each continue for several more years. However, the clinical trials for all or any of our drug candidates may take significantly longer to complete. In addition, as is the case for omecamtiv mecarbil given the CRL requirement to perform an additional Phase 3 clinical trial, the time and expense associated with an additional clinical trial may limit the commercial returns given the eventual loss of market exclusivity. The commencement and completion of our or our partners' clinical trials could be delayed or prevented by many factors, including, but not limited to:

- delays in obtaining, or inability to obtain, regulatory or other approvals to commence and conduct clinical trials in the manner we or our partners deem necessary for the appropriate and timely development of our drug candidates and commercialization of any resulting drugs;
- delays in identifying and reaching agreement, or inability to identify and reach agreement, on acceptable terms, with prospective clinical trial sites and other entities involved in the conduct of our or our partners' clinical trials;
- delays or additional costs in developing, or inability to develop, appropriate formulations of our drug candidates for clinical trial use;
- slower than expected rates of patient recruitment and enrollment;
- for those drug candidates that are the subject of a strategic alliance, delays in reaching agreement with our partner as to appropriate development strategies;
- a regulatory authority may require changes to a protocol for a clinical trial that then may require approval from regulatory agencies in other jurisdictions where the trial is being conducted;
- a regulatory authority in one jurisdiction may not accept a clinical trial design that is acceptable in another jurisdiction;
- an IRB or its foreign equivalent may require changes to a protocol that then require approval from regulatory agencies and other IRBs and their foreign equivalents, or regulatory authorities may require changes to a protocol that then require approval from the IRBs or their foreign equivalents;
- for clinical trials conducted in foreign countries, the time and resources required to identify, interpret and comply with foreign regulatory requirements or changes in those requirements, and political instability or natural disasters occurring in those countries;
- lack of effectiveness of our drug candidates during clinical trials;
- unforeseen safety issues;
- inadequate supply, or delays in the manufacture or supply, of clinical trial materials;
- uncertain dosing issues;
- failure by us, our partners, or clinical research organizations, investigators or site personnel engaged by us or our partners to comply with good clinical practices and other applicable laws and regulations, including those concerning informed consent;

- inability or unwillingness of investigators or their staffs to follow clinical protocols;
- failure by our clinical research organizations, clinical manufacturing organizations and other third parties supporting our or our partners' clinical trials to fulfill their obligations;
- inability to monitor patients adequately during or after treatment;
- introduction of new therapies or changes in standards of practice or regulatory guidance that render our drug candidates or their clinical trial endpoints obsolete; and
- results from non-clinical studies that may adversely impact the timing or further development of our drug candidates.

We do not know whether planned clinical trials will begin on time, or whether planned or currently ongoing clinical trials will need to be restructured or will be completed on schedule, if at all. Significant delays in clinical trials will impede our ability to commercialize our drug candidates and generate revenue and could significantly increase our development costs.

If we encounter difficulties enrolling patients in our clinical trials, including COURAGE-ALS and SEQUOIA-HCM, our clinical development activities could be delayed or otherwise adversely affected.

The timely completion of clinical trials in accordance with their protocols depends, among other things, on our ability to enroll a sufficient number of patients who remain in the trial until its conclusion. We may experience difficulties in patient enrollment in clinical trials for a variety of reasons. The enrollment of patients depends on many factors, including:

- the patient eligibility criteria defined in the protocol;
- the size of the patient population required for analysis of the trial's primary endpoints;
- the proximity of patients to study sites;
- the design of the trial;
- the ability to recruit clinical trial investigators with the appropriate competencies and experience;
- clinicians' and patients' perceptions as to the potential advantages of the product candidate being studied in relation to other available therapies or clinical trials, including any new drugs that may be approved for the indications we are investigating or clinical trial results;
- the ability to obtain and maintain patient consents;
- the risk that patients enrolled in clinical trials will drop out of the trials before completion;
- the effects of the COVID-19 pandemic, including governmental responses and restrictions on movement and the ability of patients to visit clinical trial sites and practicability and/or availability of virtual and/or home healthcare visits.

In addition, our and our partners' clinical trials will compete with other clinical trials for product candidates that are in the same therapeutic areas as our and our partners' product candidates, and this competition will reduce the number and types of patients available to us, because some patients who might have opted to enroll in our or our partners' trials may instead opt to enroll in a trial being conducted by one of our competitors. Since the number of qualified clinical investigators is limited, we expect to conduct some of our or our partners' clinical trials at the same clinical trial sites that some of our competitors use, which will reduce the number of patients who are available for our clinical trials in such clinical trial site.

Delays in patient enrollment may result in increased costs or may affect the timing or outcome of the planned clinical trials, which could prevent completion of these trials and adversely affect our and our partners' ability to advance the development of product candidates.

The COVID-19 pandemic continues to adversely impact our business and could materially and adversely affect our operations, as well as the businesses or operations of our or our partners, manufacturers, CROs or other third parties with whom we or our partners conduct business.

Disease outbreaks and epidemics in regions where we, our partners or other third parties on which we rely have manufacturing facilities, clinical trial sites or other important operations or pandemics such as the COVID-19 pandemic could adversely affect our business, including by causing significant disruptions in our operations and/or in the operations of third-party manufacturers and CROs upon whom we rely. For example, the COVID-19 pandemic has presented a substantial public health and economic challenge around the world and is affecting employees, patients, communities and business operations, as well as the U.S. economy and financial markets. In this regard, the COVID-19 pandemic and government measures taken in response have had a significant impact, both direct and indirect, on business and commerce, as significant reductions in business-related activities have occurred, supply chains have been disrupted and manufacturing and clinical development activities have been curtailed or suspended.

In addition, our clinical trials or those conducted by our partners may continue to be adversely affected by the COVID-19 pandemic. For example, although we do not believe it will impact our ability to fully enroll SEQUOIA-HCM in a timely fashion, due to the current COVID-19 outbreak in China, enrollment of patients in SEQUOIA-HCM in China has been adversely affected. Clinical site initiation, conduct, and patient enrollment has been and may continue to be delayed due to prioritization of medical resources toward the COVID-19 pandemic and restrictions on the ability to travel. It may not be possible to carry out some aspects of clinical trial protocols if quarantines or other restrictions impede patient movement or interrupt healthcare services. It may be necessary to suspend enrollment at some or all clinical trial sites to comply with shelter in place orders, and to reduce the risk to patients, their caretakers, and healthcare providers from contracting COVID-19. Patients may refuse home healthcare visits, particularly in medically vulnerable patient populations. Similarly, principal investigators and site staff who, as healthcare providers, may have heightened exposure to COVID-19 but also may be pulled into clinical care and away from clinical research, may adversely impact our or our partner's clinical trial operations. Further, our clinical trial patients who contract COVID-19 may (i) experience unexpected adverse medical events that could be wrongfully attributable to our investigational drugs, and (ii) experience endpoint events because of COVID-19 that could confound the interpretation of data and results relating to our investigational drugs arising from our clinical trials. Other key clinical trial activities, such as clinical trial site data monitoring and site inspections, may also be adversely affected due to limitations on travel imposed or recommended by governmental authorities, which may impact the integrity of subject data and clinical study endpoints. Finally, disruptions in our supply chain due to loss of the ability of sites to dispense study drug, travel and import/export restrictions or lack of raw materials may result in an interruption, or delays in receiving, supplies of our drug candidates from our contract manufacturing organizations or study sites, which in turn may also adversely affect our clinical trials.

The spread of COVID-19, which has caused a broad impact globally, may materially affect us economically. While the potential economic impact brought by, and the duration of, COVID-19 may be difficult to assess or predict, a continued pandemic could result in significant disruption of global financial markets, reducing our ability to access capital, which could in the future negatively affect our liquidity. In addition, a recession or market correction resulting from the spread of COVID-19 could materially affect our business and the value of our common stock.

The ultimate impact of the COVID-19 pandemic or a similar health epidemic is highly uncertain and subject to change. We do not yet know the full extent of potential delays or impacts on our business, our clinical trials, healthcare systems or the global economy as a whole. However, these effects could have a material impact on our operations, and we will continue to monitor the COVID-19 situation closely.

The failure to successfully develop, validate and obtain regulatory clearance or approval of an antibody-based immunoassay for plasma concentrations of omecamtiv mecarbil could harm our development and commercialization strategy for omecamtiv mecarbil in the United States.

In connection with our NDA for omecamtiv mecarbil, FDA may as a condition to approval require that patients treated with omecamtiv mecarbil have their blood monitored during titration for concentrations of the drug in order to ensure optimized dosing that maximizes benefits without undue increased risk. To address such a requirement, we would need to enter into an agreement with a suitable partner to develop and operationalize an antibody-based immunoassay, and no assurance can be given that we will identify a suitable partner with the necessary expertise and capabilities, agree to contractual terms that are advantageous to us, or that such partner will in fact commercialize the test in a manner that is supportive of our development and commercialization efforts for omecamtiv mecarbil. Moreover, even if we were able to identify such a partner and to reach an acceptable agreement therewith, the development of an antibody-based immunoassay may be complex from an operational and regulatory perspective. Such an immunoassay could require regulatory clearance by FDA as a companion diagnostic device and no assurance that such regulatory clearance will be obtained.

The failure to successfully develop, validate and obtain regulatory clearance or approval of an antibody based immunoassay for plasma concentrations of omecamtiv mecarbil could be required by EMA for approval of our MAA in the E.U. and as a result could delay our development and commercialization strategy for omecamtiv mecarbil in the E.U. and other countries of the EEA.

EMA may require the use of an antibody-based immunoassay that is comparable to the one developed by Microgenics Corporation, an affiliate of Thermo Fisher, and utilized in GALACTIC-HF as a condition to approval of our MAA for omecamtiv mecarbil. We currently have no agreement in place with Microgenics Corporation or any other company to develop or commercialize an immunoassay that is comparable to the one utilized in GALACTIC-HF. No assurance can be given that we will identify a suitable partner with the necessary expertise and capabilities, agree to contractual terms that are advantageous to us, or that such partner will in fact commercialize the test in a manner that is supportive of our commercialization efforts for omecamtiv mecarbil in the European Union and the other members of the EEA. Moreover, even if we were able to identify such a partner and to reach an acceptable agreement therewith, the development of an antibody-based immunoassay may be complex from an operational and regulatory perspective. Such an immunoassay would require regulatory clearances by the appropriate regulatory authorities in Europe and no assurance that such regulatory clearances will be obtained.

We depend on CROs to conduct our clinical trials and have limited control over their performance. If these CROs do not successfully carry out their contractual duties or meet expected deadlines, or if we lose any of our CROs, we may not be able to obtain regulatory approval for or commercialize our product candidates on a timely basis, if at all.

We have used and intend to continue to use a limited number of CROs within and outside of the United States to conduct clinical trials of our drug candidates and related activities. We do not have control over many aspects of our CROs' activities, and cannot fully control the amount, timing or quality of resources that they devote to our programs. CROs may not assign as high a priority to our programs or pursue them as diligently as we would if we were undertaking these programs ourselves. The activities conducted by our CROs therefore may not be completed on schedule or in a satisfactory manner. CROs may also give higher priority to relationships with our competitors and potential competitors than to their relationships with us. Outside of the United States, we are particularly dependent on our CROs' expertise in communicating with clinical trial sites and regulatory authorities and ensuring that our clinical trials and related activities and regulatory filings comply with applicable laws.

Our CROs' failure to carry out development activities on our behalf as agreed and in accordance with our and the FDA's or other regulatory agencies' requirements and applicable U.S. and foreign laws, or our failure to properly coordinate and manage these activities, could increase the cost of our operations and delay or prevent the development, approval and commercialization of our drug candidates. In addition, if a CRO fails to perform as agreed, our ability to collect damages may be contractually limited. If we fail to effectively manage the CROs carrying out the development of our drug candidates or if our CROs fail to perform as agreed, the commercialization of our drug candidates will be delayed or prevented. In many cases, our CROs have the right to terminate their agreements with us in the event of an uncured material breach. Identifying, qualifying and managing performance of third-party service providers can be difficult, time consuming and cause delays in our development programs. In addition, there is a natural transition period when a new CRO commences work and the new CRO may not provide the same type or level of services as the original provider. If any of our relationships with our third-party CROs terminate, we may not be able to enter into arrangements with alternative CROs or to do so timely or on commercially reasonable terms.

The mechanisms of action of certain of our drug candidates are unproven, and we do not know whether we will be able to develop any drug of commercial value.

We have discovered and develop drug candidates that have what we believe are novel mechanisms of action directed against cytoskeletal targets. The results we have seen for our compounds in preclinical models may not translate into similar results in humans, and results of early clinical trials in humans may not be predictive of the results of larger clinical trials that may later be conducted with our drug candidates. Even if we are successful in developing and receiving regulatory approval for a drug candidate for the treatment of a particular disease, we cannot be certain that it will be accepted by prescribers or be reimbursed by insurers or that we will also be able to develop and receive regulatory approval for that or other drug candidates for the treatment of other diseases. If we or our partners are unable to successfully develop and commercialize our drug candidates, our business will be materially harmed.

Moreover, in the event any of our competitors were to develop their own drug candidates that have a similar mechanism of action to any of our drug candidates and compounds, any efficacy or safety concerns identified during the development of such similar drug candidates may have an adverse impact on the development of our own drug candidates. For example, if a competitor's drug candidate having a similar mechanism of action as any of our own drug candidates is shown in clinical trials to give rise to serious safety concerns or have poor efficacy when administered to the target patient population, the FDA or other regulatory bodies may subject our drug candidates to increased scrutiny, leading to additional delays in development and potentially decreasing the chance of ultimate approval of our own drug candidates.

We have been granted orphan designation by the FDA and EMA for reldesemtiv for the potential treatment ALS and orphan designation by the FDA for aficamten for the potential treatment of symptomatic HCM; however, there can be no guarantee that we will receive orphan approval for reldesemtiv or aficamten, nor that we will be able to prevent third parties from developing and commercializing products that are competitive to reldesemtiv or aficamten.

We have been granted orphan drug designation in the U.S. by the FDA for reldesemtiv for the potential treatment of ALS and for aficamten for the potential treatment of symptomatic HCM. In the U.S., upon approval from the FDA of an NDA, products granted orphan drug designation are generally provided with seven years of marketing exclusivity in the U.S., meaning the FDA will generally not approve applications for other product candidates that contain the same active ingredient for the same orphan indication. Even if we are the first to obtain approval of an orphan product and are granted such exclusivity in the U.S., there are limited circumstances under which a later competitor product may be approved for the same indication during the seven-year period of marketing exclusivity, such as if the later product is shown to be clinically superior to our product or due to an inability to assure a sufficient quantity of the orphan drug.

EMA has granted orphan medicinal product designation to reldesemtiv for the potential treatment of SMA and the potential treatment of ALS. Orphan medicinal product status in the E.U. can provide up to 10 years of marketing exclusivity, meaning that another application for marketing authorization of a later similar medicinal product for the same therapeutic indication will generally not be approved in the E.U. Although we may have drug candidates that may obtain orphan drug exclusivity in Europe, the orphan approval and associated exclusivity period may be modified for several reasons, including a significant change to the orphan medicinal product designations or approval criteria after-market authorization of the orphan product (e.g., product profitability exceeds the criteria for orphan drug designation), problems with the production or supply of the orphan drug or a competitor drug, although similar, is safer, more effective or otherwise clinically superior than the initial orphan drug.

We are not guaranteed to maintain orphan status for reldesemtiv or aficamten or to receive orphan status for reldesemtiv or aficamten for any other indication or for any of our other drug candidates for any indication. We are not guaranteed to be granted orphan designation in the E.U. for aficamten by the EMA. If our drug candidates that are granted orphan status were to lose their status as orphan drugs or the marketing exclusivity provided for them in the U.S. or the E.U., our business and results of operations could be materially adversely affected. While orphan status for any of our products, if granted or maintained, would provide market exclusivity in the U.S. and the E.U. for the time periods specified above, we would not be able to exclude other companies from manufacturing and/or selling products using the same active ingredient for the same indication beyond the exclusivity period applicable to our product on the basis of orphan drug status. Moreover, we cannot guarantee that another company will not receive approval before we do of an orphan drug application in the U.S. or the E.U. for a product candidate that has the same active ingredient or is a similar medicinal product for the same indication as any of our drug candidates for which we plan to file for orphan designation and status. If that were to happen, our orphan drug applications for our drug candidate for that indication may not be approved until the competing company's period of exclusivity has expired in the U.S. or the E.U., as applicable. Further, application of the orphan drug regulations in the U.S. and Europe is uncertain, and we cannot predict how the respective regulatory bodies will interpret and apply the regulations to our or our competitors' products.

We have been granted Breakthrough Therapy Designation for aficamten by the FDA and we may seek additional special designations from regulatory authorities to expedite the review and approval process for our product candidates. However, these designations may not lead to a faster development or regulatory review or approval process, and it does not increase the likelihood that our product candidates will receive marketing approval.

We have been granted Breakthrough Therapy Designation for aficamten for oHCM by the FDA and may seek these and/or additional special designations from regulatory authorities to expedite the review and approval process for our product candidates. A breakthrough therapy is defined as a drug candidate that is intended, alone or in combination with one or more other products, to treat a serious or life-threatening disease or condition, and preliminary clinical evidence indicates that the product may demonstrate substantial improvement over existing therapies on one or more clinically important endpoints, such as substantial treatment effects observed early in clinical development. For products that have been designated as breakthrough therapies, interaction and communication between the FDA and the sponsor of the trial can help to identify the most efficient path for clinical development while minimizing the number of patients placed in ineffective control regimens. Drug candidates designated as breakthrough therapies by the FDA can also be eligible for accelerated approval. If a drug candidate is intended for the treatment of a serious or life-threatening condition and the product demonstrates the potential to address unmet medical needs for this condition, the drug candidate sponsor may apply for Fast Track Designation.

Fast Track Designation is an FDA process designed to facilitate the development and expedite the review of drugs to treat serious conditions and fill an unmet medical need. The purpose of the program is to make important new drugs available to the patient earlier. Filling an unmet medical need is defined as providing a therapy where none exists or providing a potential improvement upon the current standard of care. Once a drug candidate receives Fast Track Designation, early and frequent communication between the FDA and the sponsor is encouraged throughout the entire drug development and review process. The frequency of communication assures that questions and issues are resolved quickly, often leading to earlier drug approval and access by patients.

The FDA has broad discretion whether or not to grant these designations, so even if we believe a particular drug candidate is eligible for a particular designation, we cannot assure you that the FDA would decide to grant it. Accordingly, even if we believe one of our drug candidates meets the criteria for a designation, the FDA may disagree and instead determine not to make such designation. In any event, the receipt of a particular designation for a product candidate may not result in a faster development process, review or approval compared to drug candidates considered for approval under conventional FDA procedures and does not assure ultimate approval by the FDA. In addition, even if one or more of our drug candidates qualify as breakthrough therapies, the FDA may later decide that the products no longer meet the conditions for qualification and rescind the breakthrough designation. Further, the FDA may withdraw Fast Track Designation if it believes that the designation is no longer supported by data from a clinical development program.

If we are unable to maintain any existing Breakthrough Therapy Designation or Fast Track Designation or fail to secure such designation for any additional product candidates, this would have an adverse impact on our development timelines and our ability to obtain approval for and commercialize our product candidates.

Disruptions at the FDA and other government agencies caused by funding shortages or global health concerns could hinder their ability to hire and retain key leadership and other personnel, or otherwise prevent new products and services from being developed or commercialized in a timely manner, which could negatively impact our business.

The ability of the FDA to review and approve new products can be affected by a variety of factors, including government budget and funding levels, ability to hire and retain key personnel and accept the payment of user fees, and statutory, regulatory, and policy changes. Average review times at the agency have fluctuated in recent years as a result. In addition, government funding of other government agencies that fund research and development activities is subject to the political process, which is inherently fluid and unpredictable.

Disruptions at the FDA and other agencies may also slow the time necessary for new drugs to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, over the last several years, including for 35 days beginning on December 22, 2018, the U.S. government has shut down several times and certain regulatory agencies, such as the FDA, have had to furlough critical FDA employees and stop critical activities. If a prolonged government shutdown occurs, it could significantly impact the ability of the FDA to timely review and process our regulatory submissions, which could have a material adverse effect on our business.

Separately, in response to the global COVID-19 pandemic, the FDA had a period during which manufacturing inspections were not conducted, leading to delay, and has resumed on-site inspections of domestic manufacturing facilities subject to a risk-based prioritization system. If a prolonged government shutdown occurs, or if global health concerns continue to prevent the FDA or other regulatory authorities from conducting their regular inspections, reviews, or other regulatory activities, it could significantly impact the ability of the FDA or other regulatory authorities to timely review and process our regulatory submissions, which could have a material adverse effect on our business.

Risks Specific to our Company in connection with our Commercial Operations

Our competitors may develop drugs that are less expensive, safer and/or more effective than ours, which may diminish or eliminate the commercial success of any drugs that we may commercialize.

We compete with companies that have developed drugs or are developing drug candidates for cardiovascular diseases, diseases and conditions associated with muscle weakness or wasting and other diseases for which our drug candidates may be useful treatments.

Our competitors may:

- develop drug candidates and market drugs that are less expensive or more effective than our future drugs;
- commercialize competing drugs before we or our partners can launch any drugs developed from our drug candidates;
- hold or obtain proprietary rights that could prevent us from commercializing our products;
- initiate or withstand substantial price competition more successfully than we can;

- more successfully recruit skilled scientific workers and management from the limited pool of available talent;
- more effectively negotiate third-party licenses and strategic alliances;
- take advantage of acquisition or other opportunities more readily than we can;
- develop drug candidates and market drugs that increase the levels of safety or efficacy that our drug candidates will need to show in order to obtain regulatory approval; or
- introduce therapies or market drugs that render the market opportunity for our potential drugs obsolete.

We will compete for market share against large pharmaceutical and biotechnology companies and smaller companies that are collaborating with larger pharmaceutical companies, new companies, academic institutions, government agencies and other public and private research organizations. Many of these competitors, either alone or together with their partners, may develop new drug candidates that will compete with ours. Many of these competitors have larger research and development programs or substantially greater financial resources than we do. Our competitors may also have significantly greater experience in:

- developing drug candidates;
- undertaking preclinical testing and clinical trials;
- building relationships with key customers and opinion-leading physicians;
- obtaining and maintaining FDA and other regulatory approvals of drug candidates;
- formulating and manufacturing drugs; and
- launching, marketing and selling drugs.

If our competitors market drugs that are less expensive, safer and/or more efficacious than our potential drugs, or that reach the market sooner than our potential drugs, we may not achieve commercial success. In addition, the life sciences industry is characterized by rapid technological change. If we fail to stay at the forefront of technological change, we may be unable to compete effectively. Our competitors may render our technologies obsolete by improving existing technological approaches or developing new or different approaches, potentially eliminating the advantages in our drug discovery process that we believe we derive from our research approach and proprietary technologies.

Even if our drug candidates are approved, we may experience difficulties or delays in achieving market access, reimbursement and favorable drug pricing for our drug products.

We currently have limited interactions and relationships with payors. Over time, we anticipate that our drugs will be adopted by our patients as indicated by the labels once they are approved by regulatory authorities. To achieve this adoption, our drugs will need to be covered and listed in formularies of major pharmacy benefit managers and payors in the U.S. These major pharmacy benefit managers and payors include Medicare, Medicaid, VA, DoD, TriCare, and other commercial payors with whom we have had limited interactions. The process to achieve coverage with pharmacy benefit managers and payors can be time consuming, is not guaranteed and if achieved can impact profitability given the level of rebates often required.

Specifically in relation to omecamtiv mecarbil, even if such drug candidate is ultimately approved by the FDA or other regulatory authorities for commercialization, it may not become a guideline-directed medical therapy for heart failure or it may not reach such status in a timely manner upon commercialization, which may adversely impact its sales prospects. Furthermore, we assume omecamtiv mecarbil will have a disproportionally larger share of Medicare patients relative to commercial and other payors. Overall coverage could be delayed given Medicare's defined bid timelines for inclusion in the Medicare Part D formulary. In addition, the rebate levels we may have to offer to pharmacy benefit managers and payors to be included in their formularies may also impact the profitability of omecamtiv mecarbil.

Moreover, pricing of our drug candidates, if approved by the FDA or other regulatory authorities for commercialization, may be impacted by cost-effectiveness and economic analyses by a Health Technology Assessment organization such as the Institute for Clinical and Economic Review, or ICER, an independent non-profit research institute that produces reports analyzing the evidence underlying the effectiveness and value of drugs and other medicinal services. ICER assessments and recommended pricing based on cost-effectiveness may affect our ability to obtain favorable pricing terms with Medicare, Medicaid, VA, DoD, TriCare, and other commercial payors. For example, in November 2021, ICER published its final evidence report and policy recommendations related to CAMZYOS™ (mavacamten), a small molecule myosin inhibitor being developed by Bristol-Myers Squibb Company (formerly by MyoKardia, Inc.) that has a similar mechanism of action to aficamten. The report concluded that a majority of contributing panelists found that current evidence was not adequate to demonstrate a net health benefit for CAMZYOS™ (mavacamten) added to background therapy when compared to background therapy alone or a net health benefit of CAMZYOS™ (mavacamten) when compared to disopyramide. Moreover, ICER's final report concluded that modeling short-term clinical benefits of CAMZYOS™ (mavacamten) over a longer time period produces a health-benefit price benchmark index for CAMZYOS™ (mavacamten) between $12,000-$15,000 per year, significantly lower than the $94,870 annual list price at launch that Bristol-Myers Squibb Company has indicated. Whilst not binding on Medicare, Medicaid, VA, DoD, TriCare, and other commercial payors, or indicative of the net health benefits, ICER could conclude for aficamten a similar conclusion that could adversely impact our ability to obtain favorable pricing.

The commercial success of our products depends on the availability and sufficiency of third-party payor coverage and reimbursement.

Patients in the United States and elsewhere generally rely on third-party payors to reimburse part or all of the costs associated with their prescription drugs. Accordingly, market acceptance of our products is dependent on the extent to which third-party coverage and reimbursement is available from government health administration authorities (including in connection with government healthcare programs, such as Medicare and Medicaid in the United States), private healthcare insurers and other healthcare funding organizations. Significant uncertainty exists as to the coverage and reimbursement status of any products for which we may obtain regulatory approval. Even if we obtain coverage for a given drug product, the timeframe from approval to coverage could be lengthy, inadequate, and/or the associated reimbursement rate may not be adequate to cover our costs, including research, development, intellectual property, manufacture, sale and distribution expenses, or may require co-payments that patients find unacceptably high.

Coverage and reimbursement policies for drug products can differ significantly from payor to payor as there is no uniform policy of coverage and reimbursement for drug products among third-party payors in the United States. There may be significant delays in obtaining coverage and reimbursement as the process of determining coverage and reimbursement is often time-consuming and costly which will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage or adequate reimbursement will be obtained. It is difficult to predict at this time what third-party will decide with respect to coverage and reimbursement for our products. Coverage policies and third party reimbursement rates may change at any time. Even if favorable coverage and reimbursement status is attained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

In addition, there is significant uncertainty regarding the reimbursement status of newly approved healthcare products. We may need to conduct expensive pharmacoeconomic studies in order to demonstrate the cost-effectiveness of our products. If third-party payors do not consider our products to be cost-effective compared to other therapies, the payors may not cover our products as a benefit under their plans, or if they do, the level of payment may not be sufficient to allow us to sell our products on a profitable basis.

We expect that increased emphasis on cost containment measures in the United States by third-party payors to continue and will place pressure on pharmaceutical pricing and coverage. Coverage policies and third-party reimbursement rates may change at any time. Therefore, even if favorable coverage and reimbursement status is attained for one or more drug products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future. If we are unable to obtain and maintain sufficient third-party coverage and adequate reimbursement for our products, the commercial success of our drug products may be greatly hindered and our financial condition and results of operations may be materially and adversely affected.

We have no manufacturing capacity and depend on contract manufacturers to produce our clinical trial materials, including our drug candidates, and will have continued reliance on contract manufacturers for the development and commercialization of our potential drugs.

We do not currently operate manufacturing facilities for clinical or commercial production of our drug candidates and rely on CMOs for the manufacture of finished drug product and active pharmaceutical ingredient. We have limited experience in drug formulation and manufacturing, and we lack the resources and the capabilities to manufacture any of our drug candidates on a clinical or commercial scale.

In addition, under the Ji Xing Agreements, we have committed to providing Ji Xing with supply of aficamten and omecamtiv mecarbil for development and commercialization of aficamten and omecamtiv mecarbil in China and Taiwan, which we will have to source from our contract manufacturers. We expect to rely on contract manufacturers to supply all future drug candidates for which we conduct development, as well as other materials required to conduct our clinical trials, and to fulfil our obligations under the Ji Xing Agreements.

If any of our existing or future contract manufacturers fail to perform satisfactorily, it could delay development or regulatory approval of our drug candidates or commercialization of our drugs, producing additional losses and depriving us of potential product revenues, and also lead to our breach of one or both of the Ji Xing Agreements, giving rise to the ability to terminate such agreements and other adverse consequences as stipulated in the Ji Xing Agreements. In addition, if a contract manufacturer fails to perform as agreed, our ability to collect damages may be contractually limited.

Our drug candidates require precise high-quality manufacturing. The failure to achieve and maintain high manufacturing standards, including failure to detect or control anticipated or unanticipated manufacturing errors or the frequent occurrence of such errors, could result in patient injury or death, discontinuance or delay of ongoing or planned clinical trials, delays or failures in product testing or delivery, cost overruns, product recalls or withdrawals and other problems that could seriously hurt our business. Contract drug manufacturers often encounter difficulties involving production yields, quality control and quality assurance and shortages of qualified personnel. These manufacturers are subject to stringent regulatory requirements, including the FDA's current good manufacturing practices regulations and similar foreign laws and standards. Each contract manufacturer must pass a pre-approval inspection before we can obtain marketing approval for any of our drug candidates and following approval will be subject to ongoing periodic unannounced inspections by the FDA, the U.S. Drug Enforcement Agency and other regulatory agencies, to ensure strict compliance with current good manufacturing practices and other applicable government regulations and corresponding foreign laws and standards. We seek to ensure that our contract manufacturers comply fully with all applicable regulations, laws and standards. However, we do not have control over our contract manufacturers' compliance with these regulations, laws and standards. If one of our contract manufacturers fails to pass its pre-approval inspection or maintain ongoing compliance at any time, the production of our drug candidates could be interrupted, resulting in delays or discontinuance of our clinical trials, additional costs and potentially lost revenues. In addition, failure of any third-party manufacturers or us to comply with applicable regulations, including pre- or post-approval inspections and the current good manufacturing practice requirements of the FDA or other comparable regulatory agencies, could result in sanctions being imposed on us. These sanctions could include fines, injunctions, civil penalties, failure of regulatory authorities to grant marketing approval of our products, delay, suspension or withdrawal of approvals, license revocation, product seizures or recalls, operational restrictions and criminal prosecutions, any of which could significantly and adversely affect our business.

In addition, our existing and future contract manufacturers may not perform as agreed or may not remain in the contract manufacturing business for the time required to successfully produce, store and distribute our drug candidates. If a natural disaster, business failure, strike or other difficulty occurs, we may be unable to replace these contract manufacturers in a timely or cost-effective manner and the production of our drug candidates would be interrupted, resulting in delays, loss of customers and additional costs.

Switching manufacturers or manufacturing sites would be difficult and time-consuming because the number of potential manufacturers is limited. In addition, before a drug from any replacement manufacturer or manufacturing site can be commercialized, the FDA and, in some cases, foreign regulatory agencies, must approve that site. These approvals would require regulatory testing and compliance inspections. A new manufacturer or manufacturing site also would have to be educated in, or develop substantially equivalent processes for, production of our drugs and drug candidates. It may be difficult or impossible to transfer certain elements of a manufacturing process to a new manufacturer or for us to find a replacement manufacturer on acceptable terms quickly, or at all, either of which would delay or prevent our ability to develop drug candidates and commercialize any resulting drugs.

We may not be able to successfully manufacture our drug candidates in sufficient quality and quantity, which would delay or prevent us from developing our drug candidates and commercializing resulting approved drugs, if any.

To date, our drug candidates have been manufactured in quantities adequate for preclinical studies and early through late-stage clinical trials. In order to conduct large scale clinical trials for a drug candidate and for commercialization of the resulting drug if that drug candidate is approved for sale, we will need to manufacture some drug candidates in larger quantities. We may not be able to successfully repeat or increase the manufacturing capacity for any of our drug candidates, whether in collaboration with third-party manufacturers or on our own, in a timely or cost-effective manner or at all. If a contract manufacturer makes improvements in the manufacturing process for our drug candidates, we may not own, or may have to share, the intellectual property rights to those improvements. Significant changes or scale-up of manufacturing may require additional validation studies, which are costly and which regulatory authorities must review and approve. In addition, quality issues may arise during those changes or scale-up activities because of the inherent properties of a drug candidate itself or of a drug candidate in combination with other components added during the manufacturing and packaging process, or during shipping and storage of the finished product or active pharmaceutical ingredients. If we are unable to successfully manufacture of any of our drug candidates in sufficient quality and quantity, the development of that drug candidate and regulatory approval or commercial launch for any resulting drugs may be delayed or there may be a shortage in supply, which could significantly harm our business. In addition, data demonstrating the stability of both drug substance and drug product, using the commercial manufacturing process and at commercial scale, are required for marketing applications. Failure to produce drug substance and drug products in a timely manner and obtain stability data could result in delay of submission of marketing applications.

If we or our partners receive regulatory approval for our drug candidates, we or they will be subject to ongoing obligations to and continued regulatory review by the FDA and foreign regulatory agencies, and may be subject to additional post-marketing obligations, all of which may result in significant expense and limit commercialization of our potential drugs.

Any regulatory approvals that we or our partners receive for our drug candidates may be subject to limitations on the indicated uses for which the drug may be marketed or require potentially costly post-marketing follow-up studies or compliance with a REMS. In addition, if the FDA or foreign regulatory agencies approves any of our drug candidates, the labeling, packaging, adverse event reporting, storage, advertising, promotion and record-keeping for the drug will be subject to extensive regulatory requirements. The subsequent discovery of previously unknown problems with the drug, including adverse events of unanticipated severity or frequency, or the discovery that adverse events or toxicities observed in preclinical research or clinical trials that were believed to be minor constitute much more serious problems, may result in restrictions on the marketing of the drug or withdrawal of the drug from the market.

The FDA and foreign regulatory agencies may change their policies and additional government regulations may be enacted that could prevent or delay regulatory approval of our drug candidates. We cannot predict the likelihood, nature or extent of adverse government regulation that may arise from future legislation or administrative action, either in the United States or abroad. If we are not able to maintain regulatory compliance, we might not be permitted to market our drugs and our business would suffer.

If physicians and patients do not accept our drugs, we may be unable to generate significant revenue, if any.

Even if our drug candidates obtain regulatory approval, the resulting drugs, if any, may not gain market acceptance among physicians, healthcare payors, patients and the medical community. Even if the clinical safety and efficacy of drugs developed from our drug candidates are established for purposes of approval, physicians may elect not to recommend these drugs for a variety of reasons including, but not limited to:

- introduction of competitive drugs to the market;
- clinical safety and efficacy of alternative drugs or treatments;
- cost-effectiveness;
- availability of coverage and reimbursement from health maintenance organizations and other third-party payors;
- convenience and ease of administration;
- prevalence and severity of adverse events;
- other potential disadvantages relative to alternative treatment methods; or
- insufficient patient support;
- insufficient marketing and distribution support.

If our drugs fail to achieve market acceptance, we may not be able to generate significant revenue and our business would suffer.

Risks Specific to our Company in connection with our Intellectual Property

Our success depends substantially upon our ability to obtain and maintain intellectual property protection relating to our drug candidates, compounds and research technologies.

We own, co-own or hold exclusive licenses to a number of U.S. and foreign patents and patent applications directed to our drug candidates, compounds and research technologies. Our success depends on our ability to obtain patent protection both in the United States and in other countries for our drug candidates, their methods of manufacture and use, and our technologies. Our ability to protect our drug candidates, compounds and technologies from unauthorized or infringing use by third parties depends substantially on our ability to obtain and enforce our patents. If our issued patents and patent applications, if granted, do not adequately describe, enable or otherwise provide coverage of our technologies and drug candidates, we, our licensors or our licensees would not be able to exclude others from developing or commercializing these drug candidates. Furthermore, the degree of future protection of our proprietary rights is uncertain because legal means may not adequately protect our rights or permit us to gain or keep our competitive advantage. If we are unable to obtain and maintain sufficient intellectual property protection for our technologies and drug candidates, or if the scope of the intellectual property protection obtained is not sufficiently broad, our competitors could develop and commercialize drug candidates similar or identical to ours, and our ability to successfully commercialize product candidates that we may pursue may be impaired.

Obtaining and enforcing biopharmaceutical patents is costly, time consuming and complex, and we may not be able to file and prosecute all necessary or desirable patent applications, or maintain, enforce and license any patents that may issue from such patent applications, at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection. We may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the rights to patents licensed to third parties. Therefore, these patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business.

Due to evolving legal standards relating to the patentability, validity and enforceability of patents covering pharmaceutical inventions and the claim scope of these patents, our ability to enforce our existing patents and to obtain and enforce patents that may issue from any pending or future patent applications is uncertain and involves complex legal, scientific and factual questions. The standards which the U.S. Patent and Trademark Office and its foreign counterparts use to grant patents are not always applied predictably or uniformly and are subject to change. To date, no consistent policy has emerged regarding the breadth of claims allowed in biotechnology and pharmaceutical patents. Thus, we cannot be sure that any patents will issue from any pending or future patent applications owned by, co-owned by or licensed to us. Even if patents do issue, we cannot be sure that the claims of these patents will be held valid or enforceable by a court of law, will provide us with any significant protection against competitive products, or will afford us a commercial advantage over competitive products. In particular:

- we or our licensors might not have been the first to make the inventions covered by each of our pending patent applications or issued patents;
- we or our licensors might not have been the first to file patent applications for the inventions covered by our pending patent applications or issued patents;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- some or all of our or our licensors' pending patent applications may not result in issued patents or the claims that issue may be narrow in scope and not provide us with competitive advantages;
- our and our licensors' issued patents may not provide a basis for commercially viable drugs or therapies or may be challenged and invalidated by third parties;
- our or our licensors' patent applications or patents may be subject to interference, post-grant proceedings, derivation, reexamination, inter partes review, opposition or similar legal and administrative proceedings that may result in a reduction in their scope or their loss altogether;
- we may not develop additional proprietary technologies or drug candidates that are patentable; or
- the patents of others may prevent us or our partners from discovering, developing or commercializing our drug candidates.

We may not be able to protect our intellectual property rights throughout the world. Patent protection is afforded on a country-by-country basis. Filing, prosecuting and defending patents on our product candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States can be less extensive than those in the United States. Many companies have encountered significant difficulties in protecting and defending intellectual property rights in foreign jurisdictions. Some of our development efforts are performed in countries outside of the United States through third-party contractors. We may not be able to effectively monitor and assess intellectual property developed by these contractors. We therefore may not be able to effectively protect this intellectual property and could lose potentially valuable intellectual property rights. In addition, the legal protection afforded to inventors and owners of intellectual property in countries outside of the United States may not be as protective of intellectual property rights as in the United States. Therefore, we may be unable to acquire and protect intellectual property developed by these contractors to the same extent as if these development activities were being conducted in the United States. If we encounter difficulties in protecting our intellectual property rights in foreign jurisdictions, our business prospects could be substantially harmed.

Patent terms may be inadequate to protect our competitive position on our technologies and drug candidates for an adequate amount of time. Patents have a limited lifespan. In the United States, if all maintenance fees are timely paid, the natural expiration of a patent is generally 20 years from its earliest U.S. non-provisional filing date. Various extensions may be available, but the life of a patent, and the protection it affords, is limited. Even if patents covering our technologies and drug candidates are obtained, once the patent life has expired, we may be open to competition from competitive products, including generics or biosimilars. Given the amount of time required for the development, testing and regulatory review of new drug candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, our owned, co-owned and licensed patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours or our partners.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements. Periodic maintenance fees, renewal fees, annuity fees and various other governmental fees on patents and/or applications will be due to be paid to the USPTO and various governmental patent agencies outside of the United States in several stages over the lifetime of the patents and/or applications. Non-compliance could 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, our competitors might be able to enter the market and this circumstance would have a material adverse effect on our business.

We may be subject to claims challenging the inventorship or ownership of our patents and other intellectual property. We rely on intellectual property assignment agreements with our corporate partners, employees, consultants, scientific advisors and other collaborators to grant us ownership of new intellectual property that is developed. These agreements may not result in the effective assignment to us of that intellectual property. As a result, our ownership of key intellectual property could be compromised.

We or our licensors may be subject to claims that former employees, collaborators, consultants or other third parties have an interest in our owned, co-owned or in-licensed patents, trade secrets, or other intellectual property as an inventor or co-inventor. For example, we or our licensors may have inventorship disputes arise from conflicting obligations of employees, collaborators, consultants or others who are involved in developing our product candidates. Litigation may be necessary to defend against these and other claims challenging inventorship of our or our licensors' ownership of our owned, co-owned or in-licensed patents, trade secrets or other intellectual property. If we or our licensors fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, intellectual property that is important to our product candidates. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees. Any of the foregoing could have a material adverse effect on our business, financial condition, results of operations and prospects.

We are a party to license agreements and may need to obtain additional licenses from others to advance our research and development activities or allow the commercialization of our drug candidates and future drug candidates we may identify and pursue. If we fail to comply with our obligations in the agreements under which we license intellectual property rights from third parties or these agreements are terminated or we otherwise experience disruptions to our business relationships with our licensors, we could lose intellectual property rights that are important to our business. Our licensors might conclude that we have materially breached our obligations under such license agreements and might therefore terminate, or seek to terminate, the license agreements, thereby removing or limiting our ability to develop and commercialize products and technology covered by these license agreements. If our license agreements are terminated, we may be required to cease our development and commercialization of our product candidates. Any of the foregoing could have a material adverse effect on our competitive position, business, financial conditions, results of operations and prospects. Moreover, disputes may arise regarding intellectual property subject to a licensing agreement. The resolution of any contract interpretation disagreement that may arise could narrow what we believe to be the scope of our rights to the relevant intellectual property or technology, or increase what we believe to be our financial or other obligations under the agreement, either of which could have a material adverse effect on our business, financial condition, results of operations and prospects. Moreover, if disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on commercially acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates. Any of the foregoing could have a material adverse effect on our competitive position, business, financial conditions, results of operations and prospects.

Changes in either the patent laws or their interpretation in the United States or other countries may diminish the value of our intellectual property or our ability to obtain patents. For example, the America Invents Act of 2011 may affect the scope, strength and enforceability of our patent rights in the United States or the nature of proceedings which may be brought by us related to our patent rights in the United States.

If one or more products resulting from our drug candidates is approved for sale by the FDA and we do not have adequate intellectual property protection for those products, competitors could duplicate them for approval and sale in the United States without repeating the extensive testing required of us or our partners to obtain FDA approval. Regardless of any patent protection, under current law, an application for a generic version of a new chemical entity cannot be approved until at least five years after the FDA has approved the original product. When that period expires, or if that period is altered, the FDA could approve a generic version of our product regardless of our patent protection. An applicant for a generic version of our product may only be required to conduct a relatively inexpensive study to show that its product is bioequivalent to our product, and may not have to repeat the lengthy and expensive clinical trials that we or our partners conducted to demonstrate that the product is safe and effective. In the absence of adequate patent protection for our products in other countries, competitors may similarly be able to obtain regulatory approval in those countries of generic versions of our products.

If we are unable to protect the confidentiality of our trade secrets, the value of our technology could be materially adversely affected and our business would be harmed.

We also rely on trade secrets to protect our technology, particularly where we believe patent protection is not appropriate or obtainable. However, trade secrets are often difficult to protect, especially outside of the United States. While we endeavor to use reasonable efforts to protect our trade secrets, our or our partners' employees, consultants, contractors or scientific and other advisors may unintentionally or willfully disclose our information to competitors. In addition, confidentiality agreements, if any, executed by those individuals may not be enforceable or provide meaningful protection for our trade secrets or other proprietary information in the event of unauthorized use or disclosure. We cannot be certain that such agreements have been entered into with all relevant parties, and we cannot be certain that our trade secrets and other confidential proprietary information will not be disclosed or that competitors will not otherwise gain access to our trade secrets or independently develop substantially equivalent information and techniques. Pursuing a claim that a third party had illegally obtained and was using our trade secrets would be expensive and time-consuming, and the outcome would be unpredictable. Even if we are able to maintain our trade secrets as confidential, if our competitors lawfully obtain or independently develop information equivalent or similar to our trade secrets, our business could be harmed.

If we are not able to defend the patent or trade secret protection position of our technologies and drug candidates, then we will not be able to exclude competitors from developing or marketing competing drugs, and we may not generate enough revenue from product sales to justify the cost of development of our drugs or to achieve or maintain profitability.

If we are sued for infringing third-party intellectual property rights, it will be costly and time-consuming, and an unfavorable outcome could have a significant adverse effect on our business.

Our ability to commercialize drugs depends on our ability to use, manufacture and sell those drugs without infringing the patents or other proprietary rights of third parties. Numerous U.S. and foreign issued patents and pending patent applications owned by third parties exist in the therapeutic areas in which we are developing drug candidates and seeking new potential drug candidates. In addition, because patent applications can take several years to issue, there may be currently pending applications, unknown to us, which could later result in issued patents that our activities with our drug candidates could infringe. There may also be existing patents, unknown to us, that our activities with our drug candidates could infringe.

Other future products of ours may be impacted by patents of companies engaged in competitive programs with significantly greater resources. Further development of these products could be impacted by these patents and result in significant legal fees. If a third party claims that our actions infringe its patents or other proprietary rights, we could face a number of issues that could seriously harm our competitive position, including, but not limited to:

- infringement and other intellectual property claims that, even if meritless, can be costly and time-consuming to litigate, delay the regulatory approval process and divert management's attention from our core business operations;
- substantial damages for past infringement which we may have to pay if a court determines that our drugs or technologies infringe a third party's patent or other proprietary rights;
- a court prohibiting us from selling or licensing our drugs or technologies unless the holder licenses the patent or other proprietary rights to us, which it is not required to do; and
- if a license is available from a holder, we may have to pay substantial royalties or grant cross-licenses to our patents or other proprietary rights.

If any of these events occur, it could significantly harm our business and negatively affect our stock price.

We may undertake infringement or other legal proceedings against third parties, causing us to spend substantial resources on litigation and exposing our own intellectual property portfolio to challenge.

Third parties may infringe our patents. To prevent infringement or unauthorized use, we may need to file infringement suits, which are expensive and time-consuming. In an infringement proceeding, a court may decide that one or more of our patents is invalid, unenforceable, or both. In such case third parties may be able to use our technology without paying licensing fees or royalties. Even if the validity of our patents is upheld, a court may refuse to stop the other party from using the technology at issue on the ground that the other party's activities are not covered by our patents. Policing unauthorized use of our intellectual property is difficult, and we may not be able to prevent misappropriation of our proprietary rights, particularly in countries where the laws may not protect such rights as fully as in the United States. In addition, third parties may affirmatively challenge our rights to, or the scope or validity of, our patent rights.

The uncertainties associated with litigation could have a material adverse effect on our ability to raise the funds necessary to conduct clinical trials, continue our research programs, license necessary technology from third parties, or enter into development partnerships that would help us bring our drug candidates or other product candidates that we may identify to market. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. There could also be public announcements of the results of hearings, motions, or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of our common stock.

We may become involved in disputes with our strategic partners over intellectual property ownership, and publications by our research collaborators and clinical investigators could impair our ability to obtain patent protection or protect our proprietary information, either of which would have a significant impact on our business.

Inventions discovered under our current or future strategic alliance agreements may become jointly owned by our strategic partners and us in some cases, and the exclusive property of one of us in other cases. Under some circumstances, it may be difficult to determine who owns a particular invention or whether it is jointly owned, and disputes could arise regarding ownership or 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 were not able to protect or license rights to these inventions. In addition, our research collaborators and clinical investigators generally have contractual rights to publish data arising from their work. Publications by our research collaborators and clinical investigators relating to our research and development programs, either with or without our consent, could benefit our current or potential competitors and may impair our ability to obtain patent protection or protect our proprietary information, which could significantly harm our business.

We may be subject to claims that our employees, consultants or independent contractors have wrongfully used or disclosed confidential information of third parties or that we or our employees have wrongfully used or disclosed trade secrets of their former employers.

Many of our employees were previously employed at universities or other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although no legal proceedings against us are currently pending, we may be subject to claims that these employees or we have inadvertently or otherwise used or disclosed trade secrets or other proprietary information of their former employers. Litigation may be necessary to defend against these claims. If we fail in defending these claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. A loss of key research personnel or their work product could hamper or prevent our ability to develop and commercialize certain potential drugs, which could significantly harm our business. Even if we are successful in defending against these claims, litigation could result in substantial costs and distract management.

Financial Risks

We have a history of significant losses and may not achieve or sustain profitability and, as a result, you may lose part or all of your investment.

We have generally incurred operating losses in each year since our inception in 1997, due to costs incurred in connection with our research and development activities and general and administrative costs associated with our operations. Our drug candidates are all in early through late-stage clinical testing, and we must conduct significant additional clinical trials before we and our partners can seek the regulatory approvals necessary to begin commercial sales of our drugs. We expect to incur increasing losses for at least several more years, as we continue our research activities and conduct development of, and seek regulatory approvals for, our drug candidates, and commercialize any approved drugs. If our drug candidates fail or do not gain regulatory approval, or if our drugs do not achieve market acceptance, we will not be profitable. If we fail to become and remain profitable, or if we are unable to fund our continuing losses, you could lose part or all of your investment.

We will need substantial additional capital in the future to sufficiently fund our operations.

We have consumed substantial amounts of capital to date, and our operating expenditures will increase over the next several years as we expand our research and development activities and expand our organization to prepare for commercialization of any approved drug. We have funded our operations and capital expenditures with proceeds primarily from private and public sales of our equity securities, royalty monetization agreements, revenue interest agreements, strategic alliances, long-term debt, other financings, interest on investments and grants. We believe that our existing cash and cash equivalents, short-term investments and interest earned on investments should be sufficient to meet our projected operating requirements for at least the next 12 months. We have based this estimate on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we currently expect. Because of the numerous risks and uncertainties associated with the development of our drug candidates and other research and development activities, including risks and uncertainties that could impact the rate of progress of our development activities, we are unable to estimate with certainty the amounts of capital outlays and operating expenditures associated with these activities.

For the foreseeable future, our operations will require significant additional funding, in large part due to our research and development expenses, the organizational scale up and associated expenditures with commercial readiness activities to launch approved drugs combined with the absence of any revenues from product sales. Until we can generate a sufficient amount of product revenue, we expect to raise future capital through strategic alliance and licensing arrangements, public or private equity offerings and debt financings. We do not currently have any commitments for future funding other than through loans under the RP Loan Agreement with RPDF, potential additional revenue interest sale proceeds under the RP Aficamten RPA, and reimbursements, milestone and royalty payments that we may receive under our agreements with Ji Xing. We may not receive any further funds under any of these agreements. Our ability to raise funds may be adversely impacted by current economic conditions. As a result of these and other factors, we do not know whether additional financing will be available when needed, or that, if available, such financing would be on terms favorable to our stockholders or us, and if we cannot raise the funds we need to operate our business, we will need to delay or discontinue certain research and development activities, and our stock price may be negatively affected.

We have never generated, and may never generate, revenues from commercial sales of our drugs and we may not have drugs to market for at least several years, if ever.

We currently have no drugs for sale and we cannot guarantee that we will ever develop or obtain approval to market any drugs. To receive marketing approval for any drug candidate, we must demonstrate that the drug candidate satisfies rigorous standards of safety and efficacy to the FDA in the United States and other regulatory authorities abroad. We and our partners will need to conduct significant research and preclinical and clinical testing before we or our partners can file applications with the FDA or other regulatory authorities for approval of any of our drug candidates. In addition, to compete effectively, our drugs must be easy to use, cost-effective, covered by insurance or government sponsored medical plans, and economical to manufacture on a commercial scale, compared to other therapies available for the treatment of the same conditions. We may not achieve any of these objectives. Currently, our clinical-stage drug candidates include omecamtiv mecarbil for the potential treatment of heart failure, reldesemtiv for the potential treatment of ALS and potentially other indications associated with muscle weakness, and aficamten for the potential treatment of HCM and potentially other indications. We cannot be certain that the clinical development of our current or any future drug candidates will be successful, that they will receive the regulatory approvals required to commercialize them, that they will ultimately be accepted by prescribers or reimbursed by insurers or that any of our other research programs will yield a drug candidate suitable for clinical testing or commercialization. For example, our NDA for omecamtiv mecarbil for the treatment of HFrEF resulted in a CRL notwithstanding the fact that GALACTIC-HF met its primary efficacy endpoint, and that the results from an additional clinical trial of omecamtiv mecarbil are required to establish substantial evidence of effectiveness for the treatment of HFrEF, with benefits that outweigh the risks. Our commercial revenues, if any, will be derived from sales of drugs that may not be commercially marketed for several years, if at all. The development of any one or all of these drug candidates may be discontinued at any stage of our clinical trials programs and we may not generate revenue from any of these drug candidates.

Our indebtedness and liabilities could limit the cash flow available for our operations, expose us to risks that could adversely affect our business, financial condition and results of operations and impair our ability to satisfy our obligations under the 2026 Notes, the 2027 Notes and the RP Loan Agreement.

As of December 31, 2022, we had $611.1 million aggregate principal amount of indebtedness, comprised of $50.0 million under the RP Loan Agreement, $21.1 million under our 2026 Notes, and $540.0 million under our 2027 Notes.

We may also incur additional indebtedness to meet future financing needs. Our indebtedness could have significant negative consequences for our security holders and our business, results of operations and financial condition by, among other things:

- increasing our vulnerability to adverse economic and industry conditions;
- limiting our ability to obtain additional financing;
- requiring the dedication of a substantial portion of our cash flow from operations to service our indebtedness, which will reduce the amount of cash available for other purposes;
- limiting our flexibility to plan for, or react to, changes in our business;
- diluting the interests of our existing stockholders as a result of issuing shares of our common stock upon conversion of the Convertible Notes; and
- placing us at a possible competitive disadvantage with competitors that are less leveraged than us or have better access to capital.

Our business may not generate sufficient funds, and we may otherwise be unable to maintain sufficient cash reserves, to pay amounts due under our indebtedness and our cash needs may increase in the future. In addition, any required repurchase of the Convertible Notes for cash as a result of a fundamental change would lower our current cash on hand such that we would not have those funds available for us in our business. Further any future indebtedness that we may incur may contain financial and other restrictive covenants that limit our ability to operate our business, raise capital or make payments under our other indebtedness. If we fail to comply with these covenants or to make payments under our indebtedness when due, then we would be in default under that indebtedness, which could, in turn, result in that and our other indebtedness becoming immediately payable in full.

Covenants in the RP Loan Agreement, the RP Aficamten RPA, the RP OM RPA, and the indentures related to our Convertible Notes restrict our business and operations in many ways and if we do not effectively manage our covenants, our financial conditions and results of operations could be adversely affected. Our operations may not provide sufficient cash to meet our debt repayment obligations.

The RP Loan Agreement, the RP Aficamten RPA, the RP OM RPA, and the indentures related to the Convertible Notes require that we comply with certain covenants applicable to us, including among other things, covenants restricting dispositions, changes in business, management, ownership or business locations, mergers or acquisitions, indebtedness, encumbrances, distributions, investments, transactions with affiliates and subordinated debt, any of which could restrict our business and operations, particularly our ability to respond to changes in our business or to take specified actions to take advantage of certain business opportunities that may be presented to us. In addition, the RP Aficamten RPA and the RP OM RPA contain certain covenants applicable to us, including among other things, development and commercialization diligence obligations in connection to aficamten and omecamtiv mecarbil and reporting obligations, which could also restrict our business and operations, particularly in connection to our development and commercialization of aficamten and omecamtiv mecarbil.

Our failure to comply with any of the covenants could result in a default under the RP Loan Agreement, the RP Aficamten RPA, the RP OM RPA, or the indentures related to the Convertible Notes, which could permit the counterparties to declare all or part of any outstanding borrowings or other payment obligations to be immediately due and payable and/or enforce any outstanding liens against our assets.

We have no rights to repurchase the revenue interests in omecamtiv mecarbil or aficamten sold to RPFT or RPI ICAV respectively, thereby limiting our ability to eliminate future applicability of the covenants contained in the RP OM RPA and the RP Aficamten RPA, and although we do have voluntary prepayment rights under the RP Loan Agreement, any voluntary prepayment rights will require that we pay RPDF 190% of the principal amount of amounts disbursed to us as tranche 1, tranche 4 and tranche 5 loans and 200% for tranche 2 and tranche 3 loans, thereby making it potentially disadvantageous to voluntarily prepay RPDF prior to the final maturity date applicable to loans outstanding under the RP Loan Agreement.

In addition, certain provisions in the 2026 Notes, the 2027 Notes and the related indentures could make a third-party attempt to acquire us more difficult or expensive. For example, if a takeover constitutes a fundamental change under our indenture, then noteholders will have the right to require us to repurchase their notes for cash. In addition, if a takeover constitutes a make-whole fundamental change under our indenture, then we may be required to temporarily increase the conversion rate. In either case, and in other cases, our obligations under the Convertible Notes and the related Indentures could increase the cost of acquiring us or otherwise discourage a third party from acquiring us or removing incumbent management, including in a transaction that noteholders or holders of our common stock may view as favorable.

Finally, should we be unable to comply with our covenants or if we default on any portion of our outstanding borrowings under the RP Loan Agreement, in addition to its rights to accelerate and demand for immediate repayment of amounts outstanding under the RP Loan Agreement, we would be liable for default interest at a rate of 4% over the prime rate.

We may not be entitled to obtain additional loan disbursements under the RP Loan Agreement or the RP Aficamten RPA.

On January 7, 2022, we announced that we had entered into the RP Loan Agreement and the RP Aficamten RPA with each of RPDF and RPI ICAV respectively, each such entity being affiliated with Royalty Pharma International plc. Together these agreements make available to us up to $150.0 million in revenue interest sale proceeds under the RP Aficamten RPA and up to $300.0 million in loans, of which a $50.0 million loan and $50.0 million in revenue interest sale proceeds were paid to us at the closing of such transactions. In addition, on March 10, 2022, we received a further $50.0 million in revenue interest sale proceeds from RPI ICAV under the RP Aficamten RPA following the initiation of our first pivotal trial in oHCM for aficamten. However, additional loan disbursements and sale proceeds under the RP Aficamten RPA and the RP Loan Agreement are subject to our satisfaction of certain conditions related to the development of aficamten and omecamtiv mecarbil, in certain cases by specific deadlines. Should we not satisfy such conditions by the applicable deadlines, or in the event we fail to meet our obligations or default under these agreements, the actual amount of additional loan disbursements and/or sale proceeds could be substantially less than the maximum amounts available thereunder.

As a result of FDA's CRL in response to our NDA for omecamtiv mecarbil, we do not expect to satisfy the conditions for the availability of disbursement of the $50 million tranche 2 and $25 million tranche 3 term loans under the RP Loan Agreement.

We are subject to counterparty risk under the RP Aficamten RPA and the RP Loan Agreement

We are subject to counterparty risk in the event that either RPDF or RP ICAV default on their respective obligations under the RP Loan Agreement or the RP Aficamten RPA respectively.

In respect of the RP Aficamten RPA, our ability to receive additional revenue interest sale proceeds is subject to the risk that RPI ICAV may default or otherwise fail to perform its obligations thereunder to pay us additional revenue interest sale proceeds that we would be entitled to upon satisfaction of certain conditions. In such event, subject to a cure right of RPI ICAV, we will have a limited right to reduce the amount of royalty payable by unless such obligation is contested in good faith, but otherwise our exposure to the credit risk of RPI ICAV will not be secured by any collateral. If RPI ICAV becomes subject to insolvency proceedings, we will become an unsecured creditor in those proceedings with a claim equal to our exposure at the time under such transaction and without any reversion of the revenue interest having been sold to RPI ICAV (other than the aforementioned reduction) and without any recourse against Royalty Pharma International plc or any of its other affiliated or controlled entities.

In respect of the RP Loan Agreement, our ability to receive additional loan disbursements is subject to the risk that RPDF may default or otherwise fail to perform its obligations thereunder to extend additional loan disbursement that we would be entitled to upon satisfaction of certain conditions. In such event, we have no recourse against Royalty Pharma International plc or any of its other affiliated or controlled entities, and in the event of an RPDF insolvency, we would have no rights to additional loan disbursements from RPDF.

Conversion of our outstanding Convertible Notes may result in the dilution of existing stockholders, create downward pressure on the price of our common stock, and restrict our ability to take advantage of future opportunities.

The Convertible Notes may be converted into cash and shares of our common stock (subject to our right or obligation to pay cash in lieu of all or a portion of such shares). If shares of our common stock are issued to the holders of the Convertible Notes upon conversion, there will be dilution to our stockholders' equity and the market price of our shares may decrease due to the additional selling pressure in the market. Any downward pressure on the price of our common stock caused by the sale or potential sale of shares issuable upon conversion of the Convertible Notes could also encourage short sales by third parties, creating additional selling pressure on our stock. The existence of the Convertible Notes and the obligations that we incurred by issuing them may restrict our ability to take advantage of certain future opportunities, such as engaging in future debt or equity financing activities.

We will depend on Ji Xing for the development and commercialization of aficamten and omecamtiv mecarbil in China and Taiwan.

Under the terms of the Ji Xing Agreements, Ji Xing will be responsible for the development and commercialization of aficamten and omecamtiv mecarbil in China and Taiwan. The timing and amount of any milestone and royalty payments we may receive under the Ji Xing Agreements will depend in part on the efforts and successful commercialization of aficamten and omecamtiv mecarbil by Ji Xing. We do not control the individual efforts of Ji Xing, and any failure by Ji Xing to devote sufficient time and effort to the development and commercialization of aficamten or omecamtiv mecarbil or to meet its obligations to us, including for future milestone and royalty payments; or to adequately deploy business continuity plans in the event of a crisis, or to satisfactorily resolve significant disagreements with us could each have an adverse impact on our financial results and operations. We will also depend on Ji Xing to comply with all applicable laws relative to the development and commercialization of aficamten and omecamtiv mecarbil in China and Taiwan. If Ji Xing were to violate, or was alleged to have violated, any laws or regulations during the performance of its obligations for us, it is possible that we could suffer financial and reputational harm or other negative outcomes, including possible legal consequences.

Any termination, breach or expiration of the Ji Xing Agreements could have a material adverse effect on our financial position by reducing or eliminating the potential for us to receive milestones and royalties. In such an event, we may be required to devote additional efforts and to incur additional costs associated with pursuing the development and commercialization of aficamten and omecamtiv mecarbil in China and Taiwan. Alternatively, we may attempt to identify and transact with a new sub-licensee, but there can be no assurance that we would be able to identify a suitable sub-licensee or transact on terms that are favorable to us.

Our ability to use net operating loss carryforwards and tax credit carryforwards to offset future taxable income may be subject to certain limitations, and ownership changes may limit our ability to use our net operating losses and tax credits in the future.

Our ability to use our federal and state NOLs to offset potential future taxable income and reduce related income taxes depends upon our generation of future taxable income. We cannot predict with certainty when, or whether, we will generate sufficient taxable income to use our NOLs.

Our federal NOLs generated in taxable years beginning prior to 2018 will continue to be governed by tax rules in effect prior to the Tax Act, with unused NOLs expiring 20 years after we report a tax loss. These NOLs could expire unused and be unavailable to offset future taxable income. We cannot predict if and to what extent various states will conform to the Tax Act, as modified by additional tax legislation enacted in 2020.

In addition, generally, if one or more stockholders or groups of stockholders who owns at least 5% of our stock increases its ownership by more than 50% over its lowest ownership percentage within a three-year testing period, an ownership change occurs (an "Ownership Change"). Our ability to utilize our NOLs and tax credit carryforwards to reduce taxes payable in a year we have taxable income may be limited if there has been an Ownership Change in our stock. Similar rules may apply under state tax laws. We may experience Ownership Changes in the future as a result of future stock sales or other changes in the ownership of our stock, some of which are beyond our control and, as a result, NOLs generated in taxable years beginning 2017 and before, may expire unused.

Any material limitation or expiration of our NOLs and tax credit carryforwards may harm our future net income by effectively increasing our future effective tax rate, which could result in a reduction in the market price of our common stock.

Comprehensive U.S. tax reform legislation could increase the tax burden on our orphan drug programs and adversely affect our business and financial condition.

In 2017, the U.S. government enacted the Tax Act that includes significant changes to the taxation of business entities, which was modified by additional federal tax legislation in 2020. These changes include, among others, (i) a permanent reduction to the corporate income tax rate, (ii) a partial limitation on the deductibility of business interest expense and net operating loss carryforwards, (iii) a shift of the U.S. taxation of multinational corporations from a tax on worldwide income to a territorial system (along with certain rules designed to prevent erosion of the U.S. income tax base) and (iv) a one-time tax on accumulated offshore earnings held in cash and illiquid assets, with the latter taxed at a lower rate. Further, the comprehensive tax legislation, among other things, reduces the orphan drug tax credit from 50% to 25% of qualifying expenditures. When and if we become profitable, this reduction in tax credits may result in an increased federal income tax burden on our orphan drug programs as it may cause us to pay federal income taxes earlier under the revised tax law than under the prior law and, despite being partially off-set by a reduction in the corporate tax rate from a top marginal rate of 35% to a flat rate of 21%, may increase our total federal tax liability attributable to such programs.

Notwithstanding the reduction in the corporate income tax rate, the overall impact of this comprehensive tax legislation resulted in an overall reduction in our deferred tax assets, and our business and financial condition could still be adversely affected as additional guidance and regulations are issued with respect to the original tax law change. In addition, it is uncertain if and to what extent various states will conform to this comprehensive tax legislation, and states may enact suspensions or limitations on the use of net operating losses and tax credits. The impact of the 2017 tax legislation on holders of our common stock is also uncertain and could be adverse. Investors should consult with their legal and tax advisors with respect to this comprehensive tax legislation and the potential tax consequences of investing in or holding our common stock.

We are obligated to develop and maintain proper and effective internal control over financial reporting. In the future, we may not complete our execution of our internal control over financial reporting in a timely manner, or these internal controls may not be determined to be effective, which may result in additional material misstatements in our consolidated financial statements and may adversely affect investor confidence in our company and, as a result, the value of our common stock.

We are required, pursuant to Section 404 of the Sarbanes-Oxley Act, to furnish a report by management on, among other things, the effectiveness of our internal control over financial reporting.

Complying with Section 404 requires a rigorous compliance program as well as adequate time and resources. We may not be able to complete our internal control evaluation, testing and any required remediation in a timely fashion. Additionally, if we identify one or more material weaknesses in our internal control over financial reporting, we will not be able to assert that our internal controls are effective. A material weakness is a deficiency, or combination of deficiencies, in internal control over financial reporting such that there is a reasonable possibility that a material misstatement of our annual or interim financial statements will not be prevented or detected on a timely basis.

If material weaknesses are identified in the future or we are not able to comply with the requirements of Section 404 in a timely manner, our reported financial results could be materially misstated, we would receive an adverse opinion regarding our internal controls over financial reporting from our independent registered public accounting firm, and we could be subject to investigations or sanctions by regulatory authorities, which would require additional financial and management resources, and the value of our common stock could decline. To the extent we identify future weaknesses or deficiencies, there could be material misstatements in our consolidated financial statements and we could fail to meet our financial reporting obligations. As a result, our ability to obtain additional financing, or obtain additional financing on favorable terms, could be materially and adversely affected which, in turn, could materially and adversely affect our business, our financial condition and the value of our common stock. If we are unable to assert that our internal control over financial reporting is effective in the future, or if our independent registered public accounting firm is unable to express an opinion or expresses an adverse opinion on the effectiveness of our internal controls in the future, investor confidence in the accuracy and completeness of our financial reports could be further eroded, which would have a material adverse effect on the price of our common stock.

Our reported financial results may be adversely affected by changes in accounting principles generally accepted in the U.S.

We prepare our financial statements in conformity with accounting principles generally accepted in the U.S. These accounting principles are subject to interpretation by the FASB and the SEC. A change in these policies or interpretations could have a significant effect on our reported financial results, may retroactively affect previously reported results, could cause unexpected financial reporting fluctuations, and may require us to make costly changes to our operational processes and accounting systems.

Legal and Compliance Risks

Recently enacted laws, including the Inflation Reduction Act, or IRA, and potential future legislation may increase the difficulty and cost for us to obtain regulatory approval of, and to commercialize our products and affect the prices we may obtain upon commercialization.

The regulations that govern, among other things, regulatory approvals, coverage, pricing and reimbursement for new drug products vary widely from country to country. In the United States and some foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay regulatory approval of our product candidates, restrict or regulate post-approval activities and affect our ability to successfully sell any product candidates for which we obtain regulatory approval. In particular, in March 2010, the ACA was enacted, which substantially changed the way health care is financed by both governmental and private insurers, and continues to significantly impacts the U.S. pharmaceutical industry. The ACA and its implementing regulations, among other things, addressed a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for certain drugs and biologics, including our product candidates that are inhaled, infused, instilled, implanted or injected, increased the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program, extended the Medicaid Drug Rebate Program to utilization of prescriptions of individuals enrolled in Medicaid managed care organizations, subjected manufacturers to new annual fees and taxes for certain branded prescription drugs, provided incentives to programs that increase the federal government's comparative effectiveness research and established a new Medicare Part D coverage gap discount program.

Other legislative changes have been proposed and adopted in the United States since the ACA was enacted. In August 2011, the Budget Control Act of 2011, among other things, created measures for spending reductions by the U.S. Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. This includes aggregate reductions of Medicare payments to providers of 2% per fiscal year, which went into effect in April 2013, and, due to subsequent legislative amendments, will remain in effect until 2031 unless additional Congressional action is taken. Under current legislation, the actual reduction in Medicare payments will vary from 1% in 2022 to up to 4% in the final fiscal year of this sequester. In January 2013, the American Taxpayer Relief Act of 2012 was enacted which, among other things, further reduced Medicare payments to several providers, including hospitals and outpatient clinics, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Since its enactment, there have been executive, judicial and Congressional challenges to numerous elements of the ACA, as well as efforts to repeal or replace certain aspects of the ACA. For example, on June 17, 2021, the U.S. Supreme Court dismissed a challenge on procedural grounds that argued the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress. It is possible that the ACA will be subject to executive, judicial, and Congressional challenges in the future. It is unclear how any such challenges will impact the ACA and our business. Policy changes, including potential modification or repeal of all or parts of the ACA or the implementation of new health care legislation, could result in significant changes to the health care system which may adversely affect our business in unpredictable ways.

In August 2022, the Inflation Reduction Act, or IRA, was signed into law, which, among other things, includes prescription drug provisions that may impact product pricing including the potential for net price reductions and/or the ability to increase price beyond the level of inflation over the lifecycle of our products, and/or may increase our rebate obligation to Medicare. Provisions include a requirement that the HHS negotiate drug prices for single-source brand-name drugs and biologics that are among the 50 drugs with the highest total Medicare Part D spending. The law establishes a maximum fair price, outlines the process by which the Secretary of HHS will identify drugs for negotiations, and establishes non-compliance penalties for manufacturers. The IRA implements inflation rebates in Medicare when a drug's Average Manufacturer Price (AMP, in Part D) or Average Sale Price (ASP, in Part B) rises faster than the inflation index (CPI-U). In addition, the Part D drug benefit caps beneficiary spending at $2,000, eliminates the coverage gap for patients, and modifies, beginning in 2025, liabilities for drug manufacturers by replacing the 70% discount in the Coverage gap with a 10% discount in the Initial Coverage phase and a 20% discount in the Catastrophic phase.

There have been, and likely will continue to be, legislative and regulatory proposals at the foreign, federal and state levels directed at broadening the availability of healthcare and containing or lowering the cost of healthcare. However, we cannot predict the timing or substance of proposals that may be adopted in the future, particularly in light of the difficulty of advancing legislation through Congress. The continuing efforts of governments, insurance companies, managed care organizations and other payors of healthcare services to contain or reduce costs of healthcare, including by imposing price controls, may adversely affect the demand and/or potential sales for our product candidates for which we obtain regulatory approval and our ability to set a price that we believe is fair for our products. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors.

Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for pharmaceutical products. We cannot be sure whether additional legislative changes will be enacted, or whether the FDA or foreign regulations, guidance or interpretations will be changed, or what the impact of these changes on the regulatory approvals of our product candidates, if any, may be. In the United States, the E.U. and other potentially significant markets for our product candidates, government authorities and third-party payors are increasingly attempting to limit or regulate the price of medical products and services, particularly for new and innovative products and therapies, which has resulted in lower average selling prices. For example, in the United States, there have been several recent Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to drug pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. At the state level, legislatures have increasingly passed legislation and implemented regulations designed to control pharmaceutical and biological product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures, and, in some cases, to encourage importation from other countries and bulk purchasing. In addition to the enactment of the IRA, the Biden administration released an additional executive order on October 14, 2022, directing HHS to report on how the Center for Medicare and Medicaid Innovation can be further leveraged to test new models for lowering drug costs for Medicare and Medicaid beneficiaries. Furthermore, the increased emphasis on managed healthcare in the United States and on country and regional pricing and reimbursement controls in the E.U. will put additional pressure on product pricing, reimbursement and usage, which may adversely affect our future product sales. These pressures can arise from rules and practices of managed care groups, judicial decisions and governmental laws and regulations related to Medicare, Medicaid and healthcare reform, pharmaceutical reimbursement policies and pricing in general.

We cannot predict the likelihood, nature, or extent of health reform initiatives that may arise from future legislation or administrative action.

Our relationships with customers, healthcare providers, clinical trial sites and professionals and third-party payors will be subject to applicable anti-kickback, fraud and abuse and other laws and regulations. If we fail to comply with federal, state and foreign laws and regulations, including healthcare, privacy and data security laws and regulations, we could face criminal sanctions, civil penalties, contractual damages, reputational harm and diminished profits and future earnings.

Healthcare providers, including physicians and third-party payors play a primary role in the recommendation and prescription of any drug candidates for which we may obtain marketing approval. Our arrangements with customers, healthcare providers and third-party payors may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we develop, and may market, sell and distribute, our products for which we obtain marketing approval. Restrictions under applicable federal and state healthcare laws and regulations, include, but are not limited to, the following:

- The federal healthcare anti-kickback statute prohibits, among other things, persons from knowingly and willfully soliciting, offering, receiving or providing remuneration, directly or indirectly, in cash or in kind, to induce or reward either the referral of an individual for, or the purchase, order or recommendation of, any good or service, for which payment may be made under federally funded healthcare programs such as Medicare and Medicaid. This statute has been broadly interpreted to apply to manufacturer arrangements with prescribers, purchasers and formulary managers, among others. Several other countries, including the United Kingdom, have enacted similar anti-kickback, fraud and abuse, and healthcare laws and regulations.
- The federal false claims laws, including the False Claims Act, which can be enforced through whistleblower or qui tam actions, imposes penalties against individuals or entities for knowingly presenting, or causing to be presented, to the federal government, claims for payment that are false or fraudulent or making a false statement to avoid, decrease or conceal an obligation to pay money to the federal government. The government and qui tam relators have brought False Claims Act actions against pharmaceutical companies on the theory that their practices have caused false claims to be submitted to the government.

- HIPAA imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program. HIPAA also imposes obligations, including mandatory contractual terms, with respect to safeguarding the privacy, security and transmission of individually identifiable health information. HIPAA also imposes criminal liability for knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false statement in connection with the delivery of or payment for healthcare benefits, items or services.
- The federal Physician Payments Sunshine Act requires manufacturers of drugs, devices, biologics and medical supplies to report to the HHS information related to payments and other transfers of value made to or at the request of physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), other health care professionals (such as physician assistants and nurse practitioners), and teaching hospitals, as well as information regarding ownership and investment interests held by physicians and their immediate family members. Payments made to physicians and research institutions for clinical trials are included within the ambit of this law.
- Analogous state laws and regulations, such as state anti-kickback and false claims laws, may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers, and some state laws require pharmaceutical companies to comply with the pharmaceutical industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government in addition to requiring drug manufacturers to report information related to payments to physicians and other health care providers or marketing expenditures and state and local laws that require the registration of sales representatives.

Efforts to ensure that our business arrangements with third parties will comply with applicable healthcare laws and regulations will involve substantial costs. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, exclusion from government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations. Exclusion, suspension and debarment from government funded healthcare programs would significantly impact our ability to commercialize, sell or distribute any drug. If any of the physicians or other providers or entities with whom we expect to do business are found to be not in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs.

We may be subject to costly product liability or other liability claims and may not be able to obtain adequate insurance.

The use of our drug candidates in clinical trials may result in adverse events. We cannot predict all the possible harms or adverse events that may result from our clinical trials. We currently maintain limited product liability insurance. We may not have sufficient resources to pay for any liabilities resulting from a personal injury or other claim excluded from, or beyond the limit of, our insurance coverage. Our insurance does not cover third parties' negligence or malpractice, and our clinical investigators and sites may have inadequate insurance or none at all. In addition, in order to conduct clinical trials or otherwise carry out our business, we may have to contractually assume liabilities for which we may not be insured. If we are unable to look to our own insurance or a third party's insurance to pay claims against us, we may have to pay any arising costs and damages ourselves, which may be substantial.

In addition, if we commercially launch drugs based on our drug candidates, we will face even greater exposure to product liability claims. This risk exists even with respect to those drugs that are approved for commercial sale by the FDA and foreign regulatory agencies and manufactured in licensed and regulated facilities. We intend to secure additional limited product liability insurance coverage for drugs that we commercialize, but may not be able to obtain such insurance on acceptable terms with adequate coverage, or at reasonable costs. Even if we are ultimately successful in product liability litigation, the litigation would consume substantial amounts of our financial and managerial resources and may create adverse publicity, all of which would impair our ability to generate sales of the affected product and our other potential drugs. Moreover, product recalls may be issued at our discretion or at the direction of the FDA and foreign regulatory agencies, other governmental agencies or companies having regulatory control for drug sales. Product recalls are generally expensive and often have an adverse effect on the reputation of the drugs being recalled and of the drug's developer or manufacturer.

We may be required to indemnify third parties against damages and other liabilities arising out of our development, commercialization and other business activities, which could be costly and time-consuming and distract management. If third parties that have agreed to indemnify us against damages and other liabilities arising from their activities do not fulfill their obligations, then we may be held responsible for those damages and other liabilities.

European data collection is governed by restrictive regulations governing the collection, use, processing and cross-border transfer of personal information.

We may collect, process, use or transfer personal information from individuals located in the E.U. in connection with our business, including in connection with conducting clinical trials in the E.U. Additionally, if any of our product candidates are approved, we may seek to commercialize those products in the E.U. The collection and use of personal health data in the E.U. are governed by the provisions of the GDPR. This legislation imposes requirements relating to having legal bases for processing personal information relating to identifiable individuals and transferring such information outside of the EEA, including to the U.S., providing details to those individuals regarding the processing of their personal information, keeping personal information secure, having data processing agreements with third parties who process personal information, responding to individuals' requests to exercise their rights in respect of their personal information, reporting security breaches involving personal data to the competent national data protection authority and affected individuals, appointing data protection officers, conducting data protection impact assessments and record-keeping. The GDPR imposes additional responsibilities and liabilities in relation to personal data that we process and we may be required to put in place additional mechanisms ensuring compliance with the new data protection rules. Failure to comply with the requirements of the GDPR and related national data protection laws of the member states of the E.U. may result in substantial fines, other administrative penalties and civil claims being brought against us, which could have a material adverse effect on our business, financial condition and results of operations.

European data protection laws, including the GDPR, generally restrict the transfer of personal information from Europe, including the EEA, United Kingdom 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. One of the primary safeguards allowing United States companies to import personal information from Europe has been certification to the EU-U.S. Privacy Shield and Swiss-U.S. Privacy Shield frameworks administered by the United States Department of Commerce. However, the Court of Justice of the EU recently invalidated the EU-U.S. Privacy Shield. The same decision also raised questions about whether one of the primary alternatives to the EU-U.S. Privacy Shield, namely, the European Commission's Standard Contractual Clauses, can lawfully be used for personal information transfers from Europe to the United States or most other countries. At present, there are few, if any, viable alternatives to the EU-U.S. Privacy Shield and the Standard Contractual Clauses. Although we rely primarily on individuals' explicit consent to transfer their personal information from Europe to the United States and other countries, in certain cases we have relied or may rely on the Standard Contractual Clauses. Authorities in the United Kingdom and Switzerland, whose data protection laws are similar to those of the EU, may similarly invalidate use of the EU-U.S. Privacy Shield and Swiss-U.S. Privacy Shield, respectively, as mechanisms for lawful personal information transfers from those countries to the United States. As such, 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 solution, we will face increased exposure to substantial fines under European data protection laws as well as injunctions against processing personal information from Europe. Inability to import personal information from the EEA, United Kingdom or Switzerland may also restrict our clinical trial activities in Europe; limit our ability to collaborate with CROs, service providers, contractors and other companies subject to European data protection laws; and require us to increase our data processing capabilities in Europe at significant expense. Additionally, 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.

Responding to any claims relating to improper handling, storage or disposal of the hazardous chemicals and radioactive and biological materials we use in our business could be time-consuming and costly.

Our research and development processes involve the controlled use of hazardous materials, including chemicals and radioactive and biological materials. Our operations produce hazardous waste products. We cannot eliminate the risk of accidental contamination or discharge and any resultant injury from those materials. Federal, state and local laws and regulations govern the use, manufacture, storage, handling and disposal of hazardous materials. We may be sued for any injury or contamination that results from our or third parties' use of these materials. Compliance with environmental laws and regulations is expensive, and current or future environmental regulations may impair our research, development and production activities.

General Risk Factors

Our failure to attract and retain skilled personnel could impair our drug development, commercialization and financial reporting activities.

Our business depends on the performance of our senior management and key scientific, commercial and technical personnel. The loss of the services of any member of our senior management or key scientific, technical, commercial or financial reporting staff may significantly delay or prevent the achievement of drug development and other business objectives by diverting management's attention to transition matters and identifying suitable replacements. We also rely on consultants and advisors to assist us in formulating our research and development strategy. All of our consultants and advisors are either self-employed or employed by other organizations, and they may have conflicts of interest or other commitments, such as consulting or advisory contracts with other organizations, that may affect their ability to contribute to us. In addition, if and as our business grows, we will need to recruit additional executive management and scientific, technical and financial reporting personnel. There is intense competition for skilled executives and employees with relevant scientific and technical expertise, and this competition is likely to continue. Our inability to attract and retain sufficient scientific, technical, commercial and managerial personnel could limit or delay our product development or commercialization activities, which would adversely affect the development of our drug candidates and commercialization of our potential drugs and growth of our business.

Our internal computer systems, or those of our CROs, CMOs, supply chain partners, collaboration partners or other contractors or consultants, may fail or suffer security breaches, which could result in a material disruption of our drug development programs.

Despite the implementation of security measures, our internal computer systems and those of our third-party CROs, CMOs, supply chain partners, collaboration partners and other contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. If such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our drug development programs. For example, the loss of clinical study data from completed or ongoing clinical studies for any of our drug candidates could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach were to result in a loss of or damage to our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability, our operations could be compromised and the further development of our product candidates could be delayed.

Significant disruptions of information technology systems or breaches of data security could adversely affect our business.

Our business is increasingly dependent on complex and interdependent information technology systems, including internet-based systems, databases and programs, to support our business processes as well as internal and external communications. As use of information technology systems has increased, deliberate attacks and attempts to gain unauthorized access to computer systems and networks have increased in frequency and sophistication. Our information technology, systems and networks are potentially vulnerable to breakdown, malicious intrusion and computer viruses which may result in the impairment of production and key business processes or loss of data or information. We are also potentially vulnerable to data security breaches—whether by employees or others—which may expose sensitive data to unauthorized persons. We have in the past and may in the future be subject to security breaches. For example, in February 2018, we discovered that our e-mail server suffered unauthorized intrusions in which proprietary business information was accessed. In addition, in December 2019, one of our employee's email account suffered an unauthorized intrusion, leading to the submission and inadvertent payment of a fraudulent invoice in the amount of approximately one hundred thousand dollars. In December 2019, our IT systems were exposed to a ransomware attack, which partially impaired certain IT systems for a short period of time. Finally, in September 2020, one of our employees' email account suffered unauthorized access as result of a phishing incident, but we believe no sensitive information was accessed. Although we do not believe that we have experienced any material losses related to security breaches, including in three recent email "phishing" incidents or the ransomware attack, there can be no assurance that we will not suffer such losses in the future. Breaches and other inappropriate access can be difficult to detect and any delay in identifying them could increase their harm. While we have implemented measures to protect our data security and information technology systems, such measures may not prevent these events. Any such breaches of security and inappropriate access could disrupt our operations, harm our reputation or otherwise have a material adverse effect on our business, financial condition and results of operations.

Our facilities in California are located near an earthquake fault, and an earthquake or other types of natural disasters, catastrophic events or resource shortages could disrupt our operations and adversely affect our results.

All our facilities and our important documents and records, such as hard and electronic copies of our laboratory books and records for our drug candidates and compounds and our electronic business records, are located in our corporate headquarters at a single location in South San Francisco, California near active earthquake zones. If a natural disaster, such as an earthquake, fire or flood, a catastrophic event such as a disease pandemic or terrorist attack, or a localized extended outage of critical utilities or transportation systems occurs, we could experience a significant business interruption. Our partners and other third parties on which we rely may also be subject to business interruptions from such events. In addition, California from time to time has experienced shortages of water, electric power and natural gas. Future shortages and conservation measures could disrupt our operations and cause expense, thus adversely affecting our business and financial results.

We expect that our stock price will fluctuate significantly, and you may not be able to resell your shares at or above your investment price.

The stock market, particularly in recent years, has experienced significant volatility, particularly with respect to pharmaceutical, biotechnology and other life sciences company stocks, which often does not relate to the operating performance of the companies represented by the stock. Factors that could cause volatility in the market price of our common stock include, but are not limited to:

- announcements concerning any of the clinical trials for our drug candidates (including, but not limited to, the timing of initiation or completion of such trials and the results of such trials, and delays or discontinuations of such trials, including delays resulting from slower than expected or suspended patient enrollment or discontinuations resulting from a failure to meet pre-defined clinical end points);
- announcements concerning our strategic alliances;
- failure or delays in entering additional drug candidates into clinical trials;
- failure or discontinuation of any of our research programs;
- issuance of new or changed securities analysts' reports or recommendations;
- failure or delay in establishing new strategic alliances, or the terms of those alliances;
- market conditions in the pharmaceutical, biotechnology and other healthcare-related sectors;
- actual or anticipated fluctuations in our quarterly financial and operating results;
- developments or disputes concerning our intellectual property or other proprietary rights;
- introduction of technological innovations or new products by us or our competitors;
- issues in manufacturing, packaging, labeling and distribution of our drug candidates or drugs;
- market acceptance of our drugs;
- third-party healthcare coverage and reimbursement policies;
- FDA or other U.S. or foreign regulatory actions affecting us or our industry;
- litigation or public concern about the safety of our drug candidates or drugs;
- additions or departures of key personnel;
- substantial sales of our common stock by our existing stockholders, whether or not related to our performance;
- automated trading activity by algorithmic and high-frequency trading programs;
- volatility in the stock prices of other companies in our industry or in the stock market generally; and
- other factors described in this "Risk Factors" section.

These and other external factors may cause the market price and demand for our common stock to fluctuate substantially, which may limit or prevent investors from readily selling their shares of common stock and may otherwise negatively affect the liquidity of our common stock. In addition, when the market price of a stock has been volatile, holders of that stock have instituted securities class action litigation against the company that issued the stock. If any of our stockholders brought a lawsuit against us, we could incur substantial costs defending the lawsuit. Such a lawsuit could also divert our management's time and attention.

If securities or industry analysts publish inaccurate or unfavorable research about our business, our stock price and trading volume could decline.

The trading market for our common stock depends in part on the research and reports that securities or industry analysts publish about us or our business. If one or more of the analysts who covers us downgrades our stock or publishes inaccurate or unfavorable research about our business, our stock price may decline. If one or more of these analysts ceases coverage of our company or fails to publish reports on us regularly, demand for our stock could decrease, which might cause our stock price and trading volume to decline.

In addition, as required by the revenue recognition standard, ASC 606, *Revenue from Contracts with Customers*, *Revenue from Contracts with Customers*, we disclose the aggregate unsatisfied amount of transaction price allocated to performance obligations as of the end of the reporting period. It is possible that analysts and investors could misinterpret our disclosure or that the terms of our research or license agreements or other circumstances could cause our methods for preparing this disclosure to differ significantly from others, which could lead to inaccurate or unfavorable forecasts by analysts and investors.

Regardless of accuracy, unfavorable interpretations of our financial information and other public disclosures could have a negative impact on our stock price. If our financial performance fails to meet analyst estimates, for any of the reasons discussed above or otherwise, or one or more of the analysts who cover us downgrade our common stock or change their opinion of our common stock, our stock price would likely decline.

We have never paid dividends on our capital stock, and we do not anticipate paying any cash dividends in the foreseeable future.

We have paid no cash dividends on any of our classes of capital stock to date and we currently intend to retain our future earnings, if any, to fund the development and growth of our businesses. In addition, the terms of existing or any future debts may preclude us from paying these dividends.

A rating agency may not rate the notes or may assign a rating that is lower than expected.

We do not intend to seek to have the 2027 Notes rated by any rating agency. However, if one or more rating agencies rates the notes and assigns a rating that is lower than the rating that investors expect, or reduces their rating in the future, then the trading price of our common stock and the 2027 Notes could significantly decline.

In addition, market perceptions of our creditworthiness will directly affect the trading price of our common stock and the 2027 Notes. Accordingly, if a ratings agency rates any of our indebtedness in the future or downgrades or withdraws the rating, or puts us on credit watch, then the trading price of our common stock and the 2027 Notes will likely decline.

Provisions in our charter documents and under Delaware law could discourage a takeover that stockholders may consider favorable and may lead to entrenchment of management.

Our amended and restated certificate of incorporation and amended and restated bylaws contain provisions that may discourage, delay or prevent a merger, acquisition or other change in control of us that stockholders may consider favorable, including transactions in which you might otherwise receive a premium for your shares. These provisions also could limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our common stock. In addition, because our board of directors is responsible for appointing the members of our management team, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors. Among other things, these provisions:

- establish a classified board of directors with three-year staggered terms, which may delay the ability of stockholders to change the membership of a majority of our board of directors;
- eliminate cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates;
- establish the exclusive right of our board of directors to elect a director to fill a vacancy created by the expansion of the board of directors or the resignation, death or removal of a director, which prevents stockholders from being able to fill vacancies on our board of directors;
- prohibit removal of directors without cause;
- authorize our board of directors to issue preferred stock and to determine the price and other terms of those shares, including preferences and voting rights, without stockholder approval, which could be used to significantly dilute the ownership of a hostile acquirer;

- authorize our board of directors to alter our bylaws without obtaining stockholder approval;
- require the approval of at least two-thirds of the shares entitled to vote at an election of directors to adopt, amend or repeal our bylaws or repeal the provisions of our amended and restated certificate of incorporation regarding the election and removal of directors;
- prohibit stockholder action by written consent, which forces stockholder action to be taken at an annual or special meeting of our stockholders;
- require that a special meeting of stockholders be called only by the chairman of the board of directors, the chief executive officer, the president or the board of directors, which may delay the ability of our stockholders to force consideration of a proposal or to take action, including the removal of directors; and
- provide for advance notice procedures that stockholders must comply with in order to nominate candidates to our board of directors or to propose matters to be acted upon at a stockholders' meeting, which may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect the acquirer's own slate of directors or otherwise attempting to obtain control of us.

We are also subject to the anti-takeover provisions contained in Section 203 of the Delaware General Corporation Law. Under Section 203, a corporation may not, in general, engage in a business combination with any holder of 15% or more of its capital stock unless the holder has held the stock for three years or, among other exceptions, the board of directors has approved the transaction. These provisions could discourage potential acquisition proposals and could delay or prevent a change in control transaction. They could also have the effect of discouraging others from making tender offers for our common stock, including transactions that may be in your best interests. These provisions may also prevent changes in our management or limit the price that investors are willing to pay for our stock.

Claims for indemnification by our directors and officers may reduce our available funds to satisfy successful third-party claims against us and may reduce the amount of money available to us.

Our amended and restated certificate of incorporation and amended and restated bylaws provide that we will indemnify our directors and officers, in each case to the fullest extent permitted by Delaware law.

In addition, as permitted by Section 145 of the Delaware General Corporation Law, our amended and restated bylaws and our indemnification agreements that we have entered into with our directors and officers provide that:

- we will indemnify our directors and officers for serving us in those capacities or for serving other business enterprises at our request, to the fullest extent permitted by Delaware law. Delaware law provides that a corporation may indemnify such person if such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the best interests of the registrant and, with respect to any criminal proceeding, had no reasonable cause to believe such person's conduct was unlawful;
- we may, in our discretion, indemnify employees and agents in those circumstances where indemnification is permitted by applicable law;
- we are required to advance expenses, as incurred, to our directors and officers in connection with defending a proceeding, except that such directors or officers shall undertake to repay such advances if it is ultimately determined that such person is not entitled to indemnification;
- we will not be obligated pursuant to our amended and restated bylaws to indemnify a person with respect to proceedings initiated by that person against us or our other indemnitees, except with respect to proceedings authorized by our board of directors or brought to enforce a right to indemnification;
- the rights conferred in our amended and restated bylaws are not exclusive, and we are authorized to enter into indemnification agreements with our directors, officers, employees and agents and to obtain insurance to indemnify such persons; and
- we may not retroactively amend our amended and restated bylaw provisions to reduce our indemnification obligations to directors, officers, employees and agents.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

Our material facilities consist of 234,892 square feet of leased office and laboratory space at 350 Oyster Point, South San Francisco, California. Our lease over this property expires in 2033.

We believe that these facilities are suitable and adequate for our current needs.

ITEM 3. LEGAL PROCEEDINGS

We are not currently subject to any material legal proceedings.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

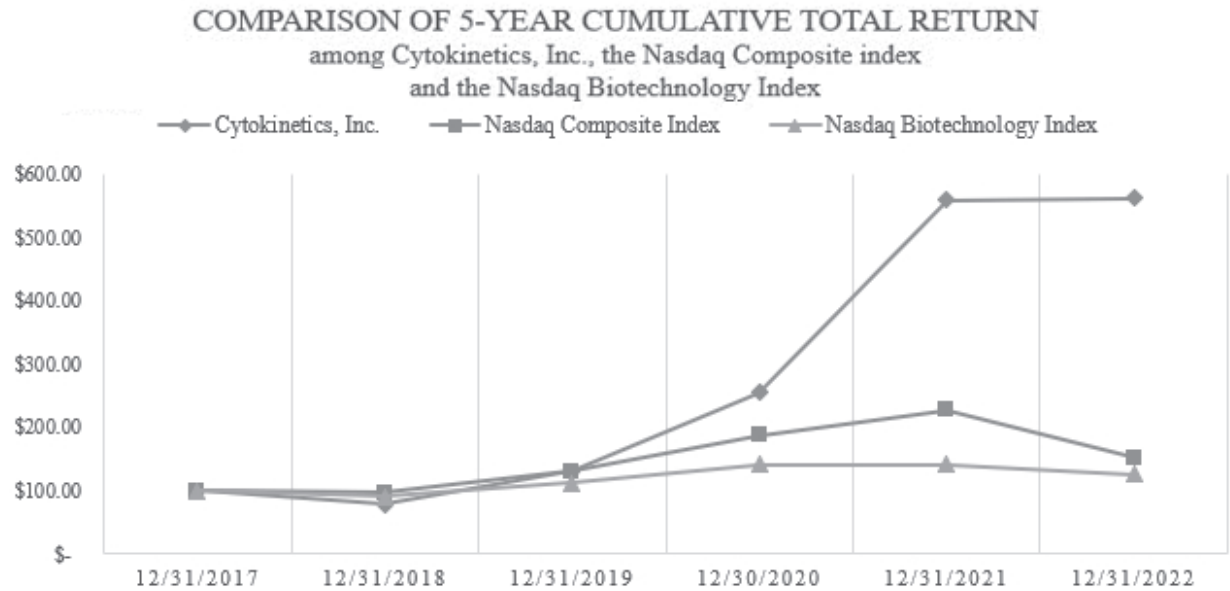
Market information for common stock

Our common stock is listed on the Nasdaq Global Select Market under the symbol "CYTK." On February 27, 2023, the last reported sale price for our common stock was $42.98 per share. We currently expect to retain future earnings, if any, for use in the operation and expansion of our business and have not paid and do not in the foreseeable future anticipate paying any cash dividends.

Performance Graph

The comparisons in the table below are required by the SEC and are not intended to forecast or be indicative of possible future performance of our common stock. This graph shall not be deemed "soliciting material" or be deemed "filed" for purposes of Section 18 of the Exchange Act, or otherwise subject to the liabilities under that Section, and shall not be deemed to be incorporated by reference into any of our filings under the Securities Act, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing, except to the extent we specifically incorporate it by reference into such filing.

The following graph compares cumulative total return of our common stock with the cumulative total return of (i) The NASDAQ Composite Index, and (ii) The NASDAQ Biotechnology Index. The graph assumes (a) $100 was invested on December 31, 2017 in each of our common stock, the stocks comprising the NASDAQ Composite Index and the stocks comprising the NASDAQ Biotechnology Index, and (b) the reinvestment of dividends into shares of common stock; however, no dividends have been declared on our common stock to date.



$100 investment in stock or index	12/31/2017	12/31/2018	12/31/2019	12/30/2020	12/31/2021	12/31/2022
Cytokinetics, Inc.	$ 100.00	$ 77.55	$ 130.18	$ 254.97	$ 559.26	$ 562.21
Nasdaq Composite Index	100.00	96.12	129.97	186.69	226.63	151.61
Nasdaq Biotechnology Index	100.00	90.68	112.81	141.78	140.88	125.52

Holders of Record

As of February 27, 2023, we had 47 holders of record of common stock. The number of holders of record is based upon the actual number of holders registered as of such date and does not include holders of shares in "street name" or persons, partnerships, associates, corporations or other entities in security position listings maintained by depositories.

Dividends

We have never declared or paid, and do not anticipate declaring or paying in the foreseeable future, any cash dividends on our capital stock. Any future determination to declare cash dividends will be made at the discretion of our board of directors, subject to applicable laws, and will depend on our financial condition, results of operations, capital requirements, general business conditions and other factors that our board of directors may deem relevant.

Unregistered Sales of Equity Securities

None.

Issuer Purchases of Equity Securities

None.

ITEM 6. [RESERVED]

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

This discussion and analysis should be read in conjunction with our financial statements and accompanying notes included elsewhere in this report. Operating results are not necessarily indicative of results that may occur in future periods.

Overview

We are a late-stage biopharmaceutical company focused on discovering, developing and commercializing first-in-class muscle activators and next-in-class muscle inhibitors as potential treatments for debilitating diseases in which muscle performance is compromised and/or declining. We have discovered and are developing muscle-directed investigational medicines that may potentially improve the health span of people with devastating cardiovascular and neuromuscular diseases of impaired muscle function. Our research and development activities relating to the biology of muscle function have evolved from our knowledge and expertise regarding the cytoskeleton, a complex biological infrastructure that plays a fundamental role within every human cell. As a leader in muscle biology and the mechanics of muscle performance, we are developing small molecule drug candidates specifically engineered to impact muscle function and contractility.

Our clinical-stage drug candidates are: omecamtiv mecarbil, a novel cardiac myosin activator, CK-136, a novel cardiac troponin activator, reldesemtiv, a novel FSTA and aficamten, a novel cardiac myosin inhibitor.

For further information regarding our business, refer to Part I, Item 1 (Business) of this Annual Report on Form 10-K.

Critical Accounting Policies and Significant Estimates

Our discussion and analysis of our financial condition and results of operations are based on our financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities and expenses and related disclosure of contingent assets and liabilities. We review our estimates on an ongoing basis. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances. Actual results may differ from these estimates under different assumptions or conditions. While our significant accounting policies are described in more detail in the notes to our financial statements included in this Annual Report on Form 10-K, we believe the following accounting policies to be critical to the judgments and estimates used in the preparation of our financial statements.

Revenue Recognition

We recognize revenue when we transfer promised goods or services to customers in an amount that reflects the consideration for those goods or services. To recognize revenue from a contract with a customer, we:

(i) identify our contracts with our customers;

(ii) identify our distinct performance obligations in each contract;

(iii) determine the transaction price of each contract;

(iv) allocate the transaction price to the performance obligations; and

(v) recognize revenue as we satisfy our performance obligations.

At contract inception, we assess the goods or services promised within each contract and assess whether each promised good or service is distinct and determine those that are performance obligations. We then recognize as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is satisfied.

Collaborative Arrangements

We enter into collaborative arrangements with partners that typically include payment to us for one of more of the following: (i) license fees; (ii) milestone payments related to the achievement of developmental, regulatory, or commercial goals; and (iii) royalties on net sales of licensed products and (iv) research and development cost reimbursement. Each of these payments results in collaboration or other revenues. Where a portion of non-refundable up-front fees or other payments received are allocated to continuing performance obligations under the terms of a collaborative arrangement, they are recorded as deferred revenue and recognized as revenue when (or as) the underlying performance obligation is satisfied.

As part of the accounting for these arrangements, we must develop estimates and assumptions that require judgment to determine the underlying stand-alone selling price for each performance obligation which determines how the transaction price is allocated among the performance obligation. The stand-alone selling price may include such items as, forecasted revenues, development timelines, reimbursement rates for personnel costs, discount rates and probabilities of technical and regulatory success, to determine the transaction price to allocate to each performance obligation.

For our collaboration agreements that include more than one performance obligation, such as a license and/or milestones combined with a commitment to perform research and development services, we make judgments to 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. We evaluate our progress each reporting period and, if necessary, adjust the measure of a performance obligation and related revenue recognition.

License Fees: If a license to our intellectual property is determined to be distinct from the other performance obligations identified in the arrangement, we recognize revenues from non-refundable, up-front fees allocated to the license when the license is transferred to the licensee and the licensee is able to use and benefit from the license. For licenses that are bundled with other promises, we utilize judgment to 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, up-front license fees. We evaluate the measure of progress each reporting period and, if necessary, adjust the measure of performance and related revenue recognition.

Milestone Payments: We use judgement to determine whether a milestone is considered probable of being reached. Using the most likely amount method, we include the value of a milestone payment in the consideration for a contract at inception if we then conclude achieving the milestone is more likely than not. Otherwise, we exclude the value of a milestone payment from contract consideration at inception and recognize revenue for a milestone at a later date, when we judge that it is more likely than not that the milestone will be achieved. If we conclude it is probable that a significant revenue reversal would not occur, the associated milestone is included in the transaction price. We then allocate the transaction price to each performance obligation on a relative stand-alone selling price basis, for which we recognize revenue as or when the performance obligations under the contract are satisfied. At the end of each subsequent reporting period, we re-evaluate the probability of achievement of such milestones and any related constraint, and if necessary, adjust our estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect license, collaboration and other revenues and earnings in the period of adjustment.

Royalties: For contracts that include sales-based royalties, we recognize revenue at the later of (i) when the related sales occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied. To date, we have not recognized any royalty revenues resulting from contracts.

Research and Development Cost Reimbursements: Our joint programs with Astellas under the Astellas OSSA Agreement, and with Amgen under the Amgen Agreement (both of the Astellas OSSA Agreement and the Amgen Agreement having now been terminated), included promises of research and development services. We also entered into the Astellas FSRA Agreement on April 23, 2020. Under the Astellas FSRA Agreement, Astellas agreed to pay one-third of the out-of-pocket clinical development costs which may be incurred in connection with our Phase 3 clinical trial of reldesemtiv in ALS, up to a maximum contribution by Astellas of $12.0 million. We determined that these services collectively were distinct from any licenses provided to Astellas and Amgen under such agreements, and as such, these services were accounted for as a separate performance obligation recorded over time. We recognized revenue for these services as the performance obligations are satisfied, which we estimated using internal research and development costs incurred.

Accrued Research and Development Expenditures

Clinical trial costs are a component of research and development expense. We accrue and expense clinical trial activities performed by third parties based upon actual work completed in accordance with agreements established with clinical research and manufacturing organizations and clinical sites. We determine the actual costs through monitoring patient enrollment, discussions with internal personnel and external service providers regarding the progress or stage of completion of trials or services and the agreed-upon fee to be paid for such services.

Revenue Participation Right Purchase Agreements

We have entered into certain revenue participation right purchase agreements for omecamtiv mecarbil and aficamten with affiliates of Royalty Pharma, pursuant to which such affiliates purchased rights to royalties from certain revenue streams in exchange for consideration. We typically account for such agreements as debt to be amortized under the effective interest rate method over the life of the related royalty stream, when we have continuing involvement with the underlying R&D. We typically account for such agreements as deferred income to be amortized under the units-of-revenue method, when there is no continuing involvement with the underlying R&D.

Revenue participation right purchase agreements are recognized using significant unobservable inputs, such as probability of success of regulatory approval and estimated timing for regulatory approval. These inputs are derived using internal management estimates developed based on third party data and reflect management's judgements, current market conditions surrounding competing products, and forecasts. We will periodically assess the amount and timing of expected royalty payments and account for any changes in such estimates on a prospective basis.

Results of Operations

A discussion of our results of operations for the year ended December 31, 2020 and year-to-year comparisons between 2021 and 2020 can be found in Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations in our 2021 Annual Report.

Revenues

Our revenues since inception were primarily from our strategic alliances. We have not generated any revenue from commercial product sales to date.

Revenues in 2022, 2021, and 2020 were as follows (in thousands):

	Years Ended December 31,			Change	
	2022	2021	2020	2022-2021	2021-2020
		(In millions)			
Research and development revenues	$ 6.6	$ 10.6	$ 16.5	$ (4.0)	$ (5.9)
License revenues	—	54.9	36.5	(54.9)	18.4
Milestone revenues	1.0	5.0	2.8	(4.0)	2.2
Realization of revenue participation right purchase agreement	87.0	—	—	87.0	—
Total revenues	$ 94.6	$ 70.5	$ 55.8	$ 24.1	$ 14.6

Research and development revenues in 2022 were primarily from Astellas for reimbursements under the Astellas FSRA Agreement and in 2021 were from Astellas and Amgen, under collaboration agreements we had in place with each.

Co-funding under the Astellas FSRA Agreement for the conduct of COURAGE-ALS will continue until the $12.0 million cap is reached. As of December 31, 2022, we are eligible to receive an additional $2.7 million in reimbursements from Astellas for COURAGE-ALS.

In 2022, we recognized milestone revenues under the Research Collaboration Agreement, dated August 24, 2012, between us and MyoKardia, Inc. In 2021, we recognized a $5.0 million in milestone revenue from Ji Xing under the Ji Xing Aficamten License Agreement for having achieved initiation of a phase 3 clinical trial for aficamten in oHCM.

In 2022, we recognized revenues of $87.0 million related to the 2020 RTW Royalty Purchase Agreement. In July 2020, we sold our right to receive Mavacamten Royalty, under the Research Collaboration Agreement, dated August 24, 2012, between us and MyoKardia, Inc. The RTW Royalty Purchase Agreement transaction closed on November 13, 2020. On March 31, 2021, RTW Royalty Holdings assigned its rights and obligations under the RTW Royalty Purchase Agreement to its affiliate, RTW ICAV. We understand that on April 18, 2022, RTW ICAV and MyoKardia, Inc. entered into agreements, which purported to assign all of RTW ICAV's rights, title and interest to the Mavacamten Royalty to MyoKardia, Inc., and on April 25, 2022, we entered into a tripartite agreement with RTW ICAV and MyoKardia, Inc. acknowledging the release and discharge of any further obligations by us or MyoKardia, Inc. in connection to the Mavacamten Royalty. As a result of the full extinguishment of the Mavacamten Royalty, we recognized revenue of $87.0 million.

License revenues for 2021 were the result of the Ji Xing OM License Agreement, pursuant to which we granted to Ji Xing an exclusive license to develop and commercialize omecamtiv mecarbil in China and Taiwan. License revenue was $54.9 million and consisted of the residual allocation of consideration from the 2021 RTW Transactions.

Research and Development Expenses

We incur research and development expenses associated with both partnered and our own research activities.

Research and development expenses related to any development we elect to fund consist primarily of employee compensation, supplies and materials, costs for consultants and contract research and manufacturing, facilities costs and depreciation of equipment.

Research and development expenses by program for 2022, 2021, and 2020 were as follows (in thousands):

	Years Ended December 31,			Change	
	2022	2021	2020	2022-2021	2021-2020
	(In millions)				
Cardiac muscle contractility	$ 125.6	$ 102.5	$ 53.0	$ 23.1	$ 49.5
Skeletal muscle contractility	67.1	27.9	17.1	39.2	10.8
All other research programs	48.1	29.5	26.9	18.6	2.6
Total research and development expenses	$ 240.8	$ 159.9	$ 97.0	$ 80.9	$ 62.9

Research and development expenses increased to $240.8 million in 2022 from $159.9 million in 2021, primarily due to higher expenses for our clinical development activities for COURAGE-ALS, for our cardiac muscle inhibitor programs, and for early research activities.

We continue to develop reldesemtiv to treat ALS.

We continue to develop aficamten to treat both oHCM and nHCM.

On February 28, 2023, we received a CRL from FDA in connection with our NDA for omecamtiv mecarbil for the treatment of HFrEF. With the CRL, FDA communicated that GALACTIC-HF is not sufficiently persuasive to establish substantial evidence of effectiveness for reducing the risk of heart failure events and cardiovascular death in adults with chronic heart failure with HFrEF, in lieu of evidence from at least two adequate and well-controlled clinical investigations. FDA stated that results from an additional clinical trial of omecamtiv mecarbil are required to establish substantial evidence of effectiveness for the treatment of HFrEF, with benefits that outweigh the risks. We expect to request a meeting with FDA in order to understand FDA's views regarding the CRL and what may be required to support potential approval of omecamtiv mecarbil. However, the Company has no plans to conduct an additional clinical trial of omecamtiv mecarbil and its focus remains on the development program for aficamten.

Under our strategic alliances with Ji Xing, Ji Xing is responsible for the development of aficamten and omecamtiv mecarbil in China and Taiwan.

Clinical development timelines, the likelihood of success and total completion costs vary significantly for each drug candidate and are difficult to estimate. We anticipate that we will determine on an ongoing basis which research and development programs to pursue and how much funding to direct to each program, taking into account the potential scientific and clinical success of each drug candidate. The lengthy process of seeking regulatory approvals and subsequent compliance with applicable regulations requires the expenditure of substantial resources. Any failure by us to obtain and maintain, or any delay in obtaining, regulatory approvals could cause our research and development expenditures to increase and, in turn, could have a material adverse effect on our results of operations.

General and Administrative Expenses

General and administrative expenses consist primarily of compensation for employees in executive and administrative functions, including, but not limited to, finance, human resources, legal, business and commercial development and strategic planning. Other significant costs include facilities costs, consulting costs and professional fees for accounting and legal services, including legal services associated with obtaining and maintaining patents and regulatory compliance.

General and administrative expenses for 2022, 2021, and 2020 were as follows (in thousands):

	Years Ended December 31,			Change	
	2022	2021	2020	2022-2021	2021-2020
		(In millions)			
Total general and administrative expenses	$ 178.0	$ 96.8	$ 52.8	$ 81.2	$ 44.0

General and administrative expenses increased to $178.0 million in 2022 from $96.8 million in 2021, primarily due to higher outside service spend in anticipation of the potential commercial launch of omecamtiv mecarbil and an increase in personnel related costs including stock-based compensation recorded in 2022.

We expect that general and administrative expenses will fluctuate in the future, depending in part on the timing of and investments in commercial readiness.

Interest Expense

Interest expense for 2022, 2021, and 2020 were as follows (in thousands):

	Years Ended December 31,			Change	
	2022	2021	2020	2022-2021	2021-2020
		(In millions)			
Term loan	$ 4.8	$ 4.8	$ 4.9	$ —	$ (0.1)
2026 Notes	3.6	11.5	10.8	(7.9)	0.7
2027 Notes	10.7	—	—	10.7	—
Warrants	—	—	0.2	—	(0.2)
Other	0.3	0.1	0.1	0.2	—
Total interest expense	$ 19.4	$ 16.4	$ 16.0	$ 3.0	$ 0.4

Interest expense in 2022 consists of interest expense related to the RP Loan Agreement between us and RPDF, interest expense related to the 2026 Notes and 2027 Notes, and interest expense related to the finance leases. Commensurate with our entry into the RP Loan Agreement, we terminated the Term Loan Agreement with Silicon Valley Bank and Oxford Finance LLC and repaid all amounts outstanding thereunder in January 2022. The RP Loan Agreement effectively replaced the Term Loan Agreement, and the interest expense is reflected as such above. In July 2022, we issued the 2027 Notes and used the net proceeds and common stock to partially repurchase the 2026 Notes.

Interest expense in 2021 consists of interest expense related to the Term Loan Agreement and respective warrants by and among us, Oxford and Silicon Valley Bank and interest expense related to the 2026 Notes. Approximately half of the 2026 Notes' interest expense is due to the amortization of the discount associated with the equity component of the 2026 Notes.

Loss on Settlement of Debt

As a result of the termination of the Term Loan Agreement and the repayment to the Lenders, in 2022, we recorded a loss of $2.7 million in loss on debt extinguishment in the consolidated statements of operations and comprehensive loss, consisting of the premium on debt repayments and the write-off of the remaining term loan fees and debt issuance costs.

As a result of the partial repurchase of the 2026 Notes in the third quarter of 2022, we recorded $22.2 million in loss on induced conversion, consisting of the difference between the consideration paid to the holders pursuant to the exchange agreements and the if-converted value of the 2026 Notes under the original terms.

Non-cash interest expense on liabilities related to revenue participation right purchase agreements

Non-cash interest expense results from the accretion of our liabilities to RPFT and RP ICAV related to the sale of future royalties under the RP OM RPA and the RP Aficamten RPA, respectively.

On January 7, 2022, we entered into the RP Aficamten RPA with RPI ICAV. Pursuant to the RP Aficamten RPA, RPI ICAV purchased the right to receive a percentage of net sales equal to 4.5% for annual worldwide net sales of pharmaceutical products containing aficamten up to $1 billion and 3.5% for annual worldwide net sales of pharmaceutical products containing aficamten in excess of $1 billion, subject to reduction in certain circumstances (the "RP Aficamten Liability"). The carrying amount of the RP Aficamten Liability is based on our estimate of the future royalties to be paid to RPI ICAV over the life of the arrangement as discounted using an imputed rate of interest. The imputed rate of interest on the unamortized portion of the RP Aficamten Liability was approximately 22.4% as of December 31, 2022.

During the third and fourth quarter of 2022, we updated our analyses of the RP Aficamten RPA to reflect our current assumptions resulting from ongoing global market research and to reflect other adjustments in connection with our anticipated commercialization. Our estimates regarding the amount of future royalty payments under the RP Aficamten RPA increased due to changes in management's estimates of unobservable inputs related to market conditions and timing. The adjustment is accounted for on a prospective basis in our liability calculation and resulted in changes in our imputed interest rate from 11.7% in the second quarter of 2022 to 22.4% in the fourth quarter of 2022. We recognized $15.5 million of non-cash interest expense in 2022 related to the RP Aficamten RPA. In 2022, the change in estimate had no impact on revenue and increased the net loss by $5.3 million. The change in accounting estimate increased the net loss per share by $0.06 in 2022.

During the third and fourth quarter of 2022, we updated our analyses of the RP OM RPA to reflect our current assumptions resulting from ongoing global market research and to reflect other adjustments in connection with our anticipated commercialization, including the result of FDA Cardiovascular and Renal Drugs Advisory Committee in December 2022 that voted the benefits of omecamtiv mecarbil do not outweigh its risks for the treatment of HFrEF. Our estimates regarding the amount of future royalty payments under the RP OM RPA decreased year over year; however, the royalty rate and probability of success increased from 2021 to 2022. The adjustments are accounted for on a prospective basis in our liability calculation and resulted in changes in our imputed interest rate and non-cash interest expense from 10.0% and $12.9 million in 2021 to 8.5% and $16.2 million in 2022, respectively. In 2022, the change in estimate had no impact on revenue and reduced the net loss by $1.8 million. The change in accounting estimate reduced the net loss per share by $0.02 in 2022.

As a result of our receipt of a CRL in connection to our NDA for omecamtiv mecarbil, our estimates regarding the amount of future royalty payments under the RP OM RPA will be re-evaluated in the first quarter of 2023 and will be accounted for on a prospective basis in our liability calculation. As a consequence of our receipt of the CRL from FDA, any approval of omecamtiv mecarbil in the United States would likely only occur after June 30, 2023, the date at which the royalty rate under the RP OM RPA will increase to no more than 5.5%. and the resulting forecast will decrease due to push out of the potential commercialization date.

We review our assumptions on a regular basis and our estimates may change in the future as we refine and reassess our assumptions.

Non-cash interest expense on liability related to the RP OM RPA and the RP Aficamten RPA for 2022, 2021, and 2020 were as follows (in thousands):

	Years Ended December 31,			Change	
	2022	2021	2020	2022-2021	2021-2020
		(In millions)			
RP OM Liability	$ 16.2	$ 12.9	$ 22.7	$ 3.3	$ (9.8)
RP Aficamten Liability	15.5	—	—	15.5	—
Total non-cash interest expense recognized	$ 31.7	$ 12.9	$ 22.7	$ 18.8	$ (9.8)

Interest and Other Income, net

Interest and other income, net for 2022, 2021, and 2020 consisted primarily of interest income generated from our cash, cash equivalents and investments.

Liquidity and Capital Resources

Our cash, cash equivalents, and investments and a summary of our borrowings and working capital is summarized as follows:

	December 31, 2022	December 31, 2021
	(In millions)	
Financial assets:		
Cash and cash equivalents	$ 65.6	$ 112.7
Short-term investments	717.0	359.0
Long-term investments	46.7	152.1
Total cash, cash equivalents, and marketable securities	$ 829.3	$ 623.8
Borrowings:		
Term loan, net	$ 63.8	$ 47.4
2026 Notes, net	$ 20.7	$ 95.5
2027 Notes, net	525.1	—
Total borrowings	$ 609.6	$ 142.9
Working capital:		
Current assets	$ 795.2	$ 535.7
Current liabilities	84.6	71.9
Working capital	$ 710.6	$ 463.8

The following table shows a summary of our cash flows for the periods set forth below:

	Years Ended December 31,		
	2022	2021	2020
		(In millions)	
Net cash (used in) provided by operating activities	$ (299.5)	$ (142.5)	$ 8.9
Net cash used in investing activities	(262.1)	(147.8)	(196.5)
Net cash provided by financing activities	516.2	320.0	234.1
Net (decrease) increase in cash, cash equivalents, and restricted cash equivalents	$ (45.4)	$ 29.7	$ 46.5

Sources and Uses of Cash

We have funded our operations and capital expenditures with proceeds primarily from private and public sales of our equity securities, a royalty monetization agreement, strategic alliances, long-term debt, other financings and interest on investments. We have generated significant operating losses since our inception. Our expenditures are primarily related to research and development activities.

Cash Flows Used in Operating Activities

Net cash used in operating activities of $299.5 million and $142.5 million for 2022 and 2021, respectively, was largely due to ongoing research and development activities and general and administrative expenses to support those activities. In 2022, the net cash used in operating activities was offset by collection of receivables primarily from our 2021 RTW Transactions. In 2021, the net cash used in operating activities was also preliminary due to operating lease liability related to the old and new facilities. Net loss for 2022 and 2021 included, among other items: non-cash stock-based compensation, non-cash interest expense on liabilities related to revenue participation right purchase agreements, and non-cash interest expense related to debt. Net loss for 2022 also included loss on settlement of debt.

Cash Flows Used in Investing Activities

Net cash used in investing activities of $262.1 million and $147.8 million for 2022 and 2021, respectively, was primarily due to purchases of investments and property and equipment offset by proceeds from maturity of investments.

Cash Flows Provided by Financing Activities

Net cash provided by financing activities of $516.2 million in 2022 was primarily due to $540.0 million of proceeds related to 2027 Notes, the proceeds related to the RP Aficamten RPA and the RP Loan Agreement, offset by the repayment of amounts owed under our Term Loan Agreement and 2026 Notes, and stock-based activities.

Net cash provided by financing activities of $320.0 million in 2021 was primarily due to $296.9 million of proceeds related to issuance of common stock in an underwritten public offering and stock-based activities.

2022 Royalty Pharma Transactions

On January 7, 2022, we announced that we had entered into that certain RP Loan Agreement and the RP Aficamten RPA with RPDF and RPI ICAV respectively, each of which were at the time of our entry into such agreements affiliated with Royalty Pharma International plc.

Under the RP Loan Agreement, we are entitled to receive up to $300.0 million in term loans, $50.0 million of which was disbursed to us on closing and the remaining $250.0 million available to us upon our satisfaction of customary disbursement conditions and certain development conditions by specific deadlines, as follows:

- $50.0 million of tranche 2 term loans during the one year period following the receipt on or prior to March 31, 2023 of marketing approval from FDA of omecamtiv mecarbil;
- $25.0 million of tranche 3 term loans during the one year period following the commercial availability of a diagnostic test measuring levels of omecamtiv mecarbil to support the final FDA label language applicable to such drug, subject to such commercial availability and the conditions to the tranche 2 term loans having occurred on or prior to March 31, 2023;
- $75.0 million of tranche 4 term loans during the one year period following the receipt on or prior to September 30, 2024 of positive results from SEQUOIA-HCM, the Phase 3 trial for aficamten; and
- $100.0 million of tranche 5 term loans during the one year period following the acceptance by the FDA on or prior to March 31, 2025 of an NDA for aficamten, subject to the conditions to the tranche 4 term loans having occurred on or prior to September 30, 2024.

As a result of our receipt of a CRL in connection to our NDA for omecamtiv mecarbil, we do not expect to satisfy the conditions to the availability of the tranche 2 and tranche 3 loans under the RP Loan Agreement.

Each term loan under the RP Loan Agreement matures on the 10 year anniversary of the funding date for such term loan and is repayable in quarterly installments of principal, interest and fees commencing on the last business day of the seventh full calendar quarter following the calendar quarter of the applicable funding date for such term loan, with the aggregate amount payable in respect of each term loan (including interest and other applicable fees) equal to 190% of the principal amount of the tranche 1, tranche 4 and tranche 5 term loans and 200% of the principal amount of the tranche 2 and tranche 3 loans (such amount with respect to each term loan, "Final Payment Amount").

We may prepay the term loans in full (but not in part) at any time at our option by paying an amount equal to the unpaid portion of Final Payment Amount for the outstanding term loans under the RP Loan Agreement; provided that if the conditions for either the tranche 4 term loans or the tranche 5 term loans have been met, we must have borrowed at least $50 million principal amount of the tranche 4 or 5 term loans. In addition, the term loans under the RP Loan Agreement are repayable in full at the option of either us or the lender in an amount equal to the unpaid portion of Final Payment Amount for the outstanding term loans upon a change of control of Cytokinetics.

In addition, on January 7, 2022, we entered into the RP Aficamten RPA with RPI ICAV, pursuant to which RPI ICAV purchased rights to certain revenue streams from net sales of pharmaceutical products containing aficamten by us, our affiliates and our licensees in exchange for up to $150.0 million in consideration, $50.0 million of which was paid on the closing date, $50.0 million of which was paid to us on March 10, 2022 following the initiation of the first pivotal trial in oHCM for aficamten, and $50.0 million of which is payable following the initiation of the first pivotal clinical trial in nHCM for aficamten. The RP Aficamten ARPA also provides that the parties will negotiate terms for additional funding if we achieve proof of concept results in certain other indications for aficamten, with a reduction in the applicable royalty if we and RPI ICAV fail to agree on such terms in certain circumstances.

Pursuant to the RP Aficamten RPA, RPI ICAV purchased the right to receive a percentage of net sales equal to 4.5% for annual worldwide net sales of pharmaceutical products containing aficamten up to $1 billion and 3.5% for annual worldwide net sales of pharmaceutical products containing aficamten in excess of $1 billion, subject to reduction in certain circumstances.

Commensurate with our entry into the RP Loan Agreement and the RP Aficamten RPA, we terminated the Term Loan Agreement with the Lenders and repaid all amounts outstanding thereunder.

Convertible Notes

On November 13, 2019, we issued $138.0 million aggregate principal amount of 2026 Notes. On July 6, 2022, we issued $540.0 million aggregate principal amount of 2027 Notes and used approximately $140.3 million of the net proceeds from the offering of 2027 Notes and issued 8,071,343 shares of common stock to repurchase approximately $116.9 million aggregate principal amount of the 2026 Notes pursuant to privately negotiated exchange agreements entered into with certain holders of the 2026 Notes concurrently with the pricing of the offering of the 2027 Notes. As a result of the partial repurchase of the 2026 Notes, we recorded an inducement loss of $22.2 million, consisting of the difference between the consideration to the holders pursuant to the exchange agreements and the if-converted value of the 2026 Notes under the original terms. As of December 31, 2022, there remains $21.1 million aggregate principal amount of 2026 Notes outstanding and $540.0 million of aggregate principal amount of 2027 Notes outstanding.

2021 Ji Xing and RTW Transactions

On December 20, 2021, we entered into the Ji Xing OM License Agreement, pursuant to which we granted to Ji Xing an exclusive license to develop and commercialize omecamtiv mecarbil in China and Taiwan. Under the terms of the Ji Xing OM License Agreement, we received a $50.0 million nonrefundable payment from Ji Xing comprised of a $40.0 million payment as consideration for the rights granted by us to Ji Xing and $10.0 million attributable to our having submitted to FDA an NDA for omecamtiv mecarbil. We may be eligible to receive from Ji Xing additional payments totaling up to $330.0 million for the achievement of certain commercial milestone events in China in connection to omecamtiv mecarbil. In addition, Ji Xing will pay us tiered royalties in the mid-teens to the low twenties range on the net sales of pharmaceutical products containing omecamtiv mecarbil in China and Taiwan, subject to certain reductions for generic competition, patent expiration and payments for licenses to third party patents. The Ji Xing OM License Agreement, unless terminated earlier, will continue on a market-by-market basis until expiration of the relevant royalty term.

In addition to the Ji Xing OM License Agreement, we entered into common stock purchase agreements with each of the RTW Investors, pursuant to which we sold and issued an aggregate of 0.5 million shares of our common stock at a price per share of $39.125 and an aggregate purchase price of $20.0 million.

Future Uses of Cash

In future periods, we expect to incur substantial costs as we continue to expand our research programs and related research and development activities. We expect to incur significant research and development expenses as we advance the research and development of compounds from our other muscle biology programs through research to candidate selection to clinical development, and we plan to file one to two investigational new drug applications in 2023. We may also incur significant sales and marketing expenses in anticipation of regulatory approval of one of our drug candidates.

Our future capital uses and requirements depend on numerous factors. These factors include, but are not limited to, the following:

- the initiation, progress, timing, scope and completion of preclinical research, non-clinical development, CMC, and clinical trials for our drug candidates and other compounds;
- the time and costs involved in obtaining regulatory approvals;
- the jurisdictions in which we are granted regulatory approvals and thus are able to successfully launch our products for commercial sale;
- delays that may be caused by requirements of regulatory agencies;
- our level of funding for the development of current or future drug candidates;
- the number of drug candidates we pursue and the stage of development that they are in;
- the costs involved in filing and prosecuting patent applications and enforcing or defending patent claims;
- our ability to establish and maintain selected strategic alliances required for the development of drug candidates and commercialization of our potential drugs;
- our plans or ability to expand our drug development capabilities, including our capabilities to conduct clinical trials for our drug candidates;
- our plans or ability to engage third-party manufacturers for our drug candidates and potential drugs;
- our plans or ability to build or access sales and marketing capabilities and to achieve market acceptance for potential drugs;
- the expansion and advancement of our research programs;
- the hiring of additional employees and consultants;

- the acquisition of technologies, products and other business opportunities that require financial commitments;
- our revenues, if any, from successful development of our drug candidates and commercialization of potential drugs; and
- the cost of additional construction to expand our headquarters in South San Francisco and in relation to our newly leased office facilities in Radnor, Pennsylvania;

We have incurred an accumulated deficit of approximately $1.6 billion since inception and there can be no assurance that we will attain profitability. We are subject to risks common to clinical-stage companies including, but not limited to, development of new drug candidates, dependence on key personnel, and the ability to obtain additional capital as needed to fund our future plans. Our liquidity will be impaired if sufficient additional capital is not available on terms acceptable to us, if at all. Until we achieve profitable operations, we intend to continue to fund operations through payments from strategic collaborations, additional sales of equity securities, grants and other financings. We have never generated revenues from commercial sales of our drugs and may not have drugs to market for at least several years, if ever. Therefore, our success is dependent on our ability to obtain additional capital by entering into new strategic collaborations and/or through financings, and ultimately on our and our collaborators' ability to successfully develop and market one or more of our drug candidates. We cannot be certain that sufficient funds will be available from such collaborators or financings when needed or on satisfactory terms. Additionally, there can be no assurance that any of our drug candidates will be accepted in the marketplace or that any future products can be developed or manufactured at an acceptable cost. These factors could have a material adverse effect on our future financial results, financial position and cash flows.

Based on the current status of our development plans, we believe that our existing cash and cash equivalents, investments and interest earned on investments will be sufficient to meet our projected operating requirements for at least the next 12 months. If, at any time, our prospects for internally financing our research and development programs decline, we may decide to reduce research and development expenses by delaying, discontinuing or reducing our funding of development of one or more of our drug candidates or of other research and development programs. Alternatively, we might raise funds through strategic relationships, public or private financings or other arrangements. There can be no assurance that funding, if needed, will be available on attractive terms, or at all, or in accordance with our planned timelines. Furthermore, financing obtained through future strategic relationships may require us to forego certain commercialization and other rights to our drug candidates. Similarly, any additional equity financing may be dilutive to stockholders and debt financing, if available, may involve restrictive covenants. Our failure to raise capital as and when needed could have a negative impact on our financial condition and our ability to pursue our business strategy.

Segment Information

We have one primary business activity and operate in one reportable segment.

Recent Accounting Pronouncements

The information required by this item is included in Item 8, Note 1, Organization and Accounting Policies, in our Consolidated Financial Statements included in this Annual Report on Form 10-K.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We are exposed to market risks in the ordinary course of our business. These risks primarily include risk related to interest rate sensitivities.

Market Risk and Interest Rate Risk

We are exposed to market risk related to changes in interest rates. As of December 31, 2022, we had cash and investments of $829.3 million, which consist of U.S. Treasury securities, U.S. and non-U.S. government agency bonds, commercial paper, global portfolio of corporate debt, money market fund, and repurchase agreements backed by U.S. Treasury securities. To reduce the volatility relating to these exposures, we have put investment and risk management policies and procedures in place. The primary objective of our investment activities is to preserve capital to fund our operations. We do not enter into investments for trading or speculative purposes and have not used any derivative financial instruments to manage our interest rate risk exposure. Our investments are subject to interest rate risk and could fall in value if market interest rates increase. We have not been exposed to, nor do we anticipate being exposed to, material risks due to changes in interest rates. A 10% increase or decrease increase or decrease in current interest rates would not have a material effect on our financial results.

We had $21.1 million under 2026 Notes with a fixed rate of 4.00% and $540.0 million under 2027 Notes with a fixed rate of 3.50% outstanding as of December 31, 2022. The convertible notes issued at fixed interest rates are exposed to fluctuations in fair value resulting from changes in market price and interest rates. We do not record our convertible debt at fair value but present the fair value for disclosure purposes (see Note 7 to our Consolidated Financial Statements). As of December 31, 2022, the fair value of the 2026 Notes and 2027 Notes was estimated at $94.8 million and $620.3 million using quoted market prices.

Foreign Currency Risk

The majority of our transactions occur in U.S. dollars. However, we do have certain transactions that are denominated in currencies other than the U.S. dollar, primarily Euro and GBP and we, therefore, are subject to foreign currency exchange risk. The fluctuation in the value of the U.S. dollar against other currencies affects the reported amounts of expenses, assets and liabilities primarily associated with a limited number of operating activities. Foreign currency transaction gains and losses have not been material to our financial statements for the year ended December 31, 2022. A 10% increase or decrease in current exchange rates would not have a material effect on our financial results.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

INDEX TO CONSOLIDATED FINANCIAL STATEMENTS

	Page
Report of Independent Registered Public Accounting Firm (PCAOB ID 42)	76
Consolidated Balance Sheets	78
Consolidated Statements of Operations and Comprehensive Loss	79
Consolidated Statements of Stockholders' (Deficit) Equity	80
Consolidated Statements of Cash Flows	81
Notes to Consolidated Financial Statements	82

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors and Stockholders
Cytokinetics, Incorporated

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Cytokinetics, Incorporated (the "Company") as of December 31, 2022 and 2021, the related consolidated statements of operations and comprehensive loss, stockholders' (deficit) equity, and cash flows for each of the three years in the period ended December 31, 2022, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2022, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 Framework) and our report dated March 1, 2023 expressed an unqualified opinion thereon.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective or complex judgments. The communication of the critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the account or disclosure to which it relates.

Estimates Related to Revenue Participation Right Purchase Agreements

Description of the Matter

As of December 31, 2022, the liabilities related to revenue participation right purchase agreements, net were $300.5 million. The Company recognized non-cash interest expense on the liabilities related to revenue participation right purchase agreements of $31.7 million for the year ended December 31, 2022. As described in Note 6 to the consolidated financial statements, the Company has entered into agreements with counterparties to monetize certain revenue streams from net sales of pharmaceutical products commercially sold by the Company, its affiliates and licensees. Cash is received upon execution of such revenue participation right purchase agreements, which are then accounted for as either a liability if the Company has significant continuing involvement in the related royalty stream or as deferred revenue if there is no significant continuing involvement. Regardless of whether there is significant continuing involvement, the Company is required to estimate the amount and timing of future royalty payments to be paid to the counterparties of the revenue participation right purchase agreements. The Company periodically assesses the amount and timing of expected royalty payments using a combination of internal projections and forecasts from external sources.

There are a number of factors that could materially affect the amount and timing of royalty payments, several of which are not within the Company's control and management's estimates of the amount and timing of royalty payments to be received or paid require the use of significant unobservable inputs. These inputs are derived using internal management estimates developed based on third party data and reflect management's judgements, current market conditions surrounding competing products, and forecasts. The significant unobservable inputs can include, to the extent applicable, estimates of patient populations, selling price, peak sales and sales ramp, the expected term of the related royalty streams, the timing of expected product launch and its impact on royalty rates, as well as the overall probability of clinical success and regulatory approval. A significant change in unobservable inputs could result in a material increase or decrease to the amount and timing of future cash flows

Auditing management's estimates of future royalty payments was especially challenging due to the significant judgment used by management in estimating the amount and timing of such payments, which required the use of subjective inputs.

How We Addressed the Matter in Our Audit

We obtained an understanding, evaluated the design, and tested the operating effectiveness of controls over the Company's processes for estimating the amount and timing of future royalty payments.

Our audit procedures included, among others, testing management's process for estimating the amount and timing of future royalty payments and evaluating the reasonableness of significant assumptions used by management when developing the estimate of expected future royalties to be paid, including estimates of patient populations, selling price, peak sales and sales ramp, the expected term of the related royalty streams, the timing of expected product launch and its impact on royalty rates, as well as the overall probability of clinical success and regulatory approval. Evaluating the reasonableness of management's assumptions included, among others, consideration of (i) relevant industry forecasts, (ii) consistency with external market research and industry data, and (iii) whether the assumptions were consistent with evidence obtained in other areas of the audit.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2018.
San Mateo, California
March 1, 2023

CYTOKINETICS, INCORPORATED

CONSOLIDATED BALANCE SHEETS

(In thousands, except share and per share data)

	December 31,	
	2022	**2021**
ASSETS		
Current assets:		
Cash and cash equivalents	$ 65,582	$ 112,666
Short-term investments	716,995	358,972
Accounts receivable	147	51,819
Prepaid expenses and other current assets	12,462	12,215
Total current assets	795,186	535,672
Long-term investments	46,708	152,050
Property and equipment, net	80,453	73,271
Operating lease right-of-use assets	82,737	73,138
Other assets	9,691	7,188
Total assets	$ 1,014,775	$ 841,319
LIABILITIES AND STOCKHOLDERS' (DEFICIT) EQUITY		
Current liabilities:		
Accounts payable	$ 25,611	$ 21,087
Accrued liabilities	44,096	34,370
Short-term operating lease liabilities	12,829	14,863
Other current liabilities	2,081	1,540
Total current liabilities	84,617	71,860
Term loan, net	63,810	47,367
Convertible notes, net	545,808	95,471
Liabilities related to revenue participation right purchase agreements, net	300,501	179,072
Long-term deferred revenue	—	87,000
Long-term operating lease liabilities	126,895	112,229
Other non-current liabilities	1,044	4,457
Total liabilities	1,122,675	597,456
Commitments and contingencies		
Stockholders' (deficit) equity:		
Preferred stock, $0.001 par value:		
Authorized: 10,000,000 shares; Issued and outstanding: none	—	—
Common stock, $0.001 par value:		
Authorized: 163,000,000 shares		
Issued and outstanding: 94,833,975 shares at December 31, 2022 and 84,799,542 shares at December 31, 2021	94	84
Additional paid-in capital	1,481,590	1,452,268
Accumulated other comprehensive loss	(3,590)	(869)
Accumulated deficit	(1,585,994)	(1,207,620)
Total stockholders' (deficit) equity	(107,900)	243,863
Total liabilities and stockholders' (deficit) equity	$ 1,014,775	$ 841,319

The accompanying notes are an integral part of these consolidated financial statements.

CYTOKINETICS, INCORPORATED

CONSOLIDATED STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS

(In thousands, except per share data)

	Years Ended December 31,		
	2022	**2021**	**2020**
Revenues:			
Research and development revenues	$ 6,588	$ 10,572	$ 16,527
License revenues	—	54,856	36,501
Milestone revenues	1,000	5,000	2,800
Realization of revenue participation right purchase agreement	87,000	—	—
Total revenues	94,588	70,428	55,828
Operating expenses:			
Research and development	240,813	159,938	96,951
General and administrative	177,977	96,803	52,820
Total operating expenses	418,790	256,741	149,771
Operating loss	(324,202)	(186,313)	(93,943)
Interest expense	(19,414)	(16,440)	(15,963)
Loss on settlement of debt	(24,939)	—	—
Non-cash interest expense on liabilities related to revenue participation right purchase agreements	(31,742)	(12,892)	(22,713)
Interest and other income, net	11,342	331	5,329
Net loss	$ (388,955)	$ (215,314)	$ (127,290)
Net loss per share — basic and diluted	$ (4.33)	$ (2.80)	$ (1.97)
Weighted-average number of shares used in computing net loss per share — basic and diluted	89,825	76,886	64,524
Other comprehensive loss:			
Unrealized loss on available-for-sale securities, net	(2,721)	(1,018)	(530)
Comprehensive loss	$ (391,676)	$ (216,332)	$ (127,820)

The accompanying notes are an integral part of these consolidated financial statements.

CYTOKINETICS, INCORPORATED
CONSOLIDATED STATEMENTS OF STOCKHOLDERS' (DEFICIT) EQUITY
(In thousands, except shares)

	Common Stock		Additional Paid-In	Accumulated Other Comprehensive	Accumulated	Total Stockholders'
	Shares	Amount	Capital	(loss) Income	Deficit	(Deficit) Equity
Balance, December 31, 2019	59,172,124	$ 59	$ 853,341	$ 679	$ (865,016)	$ (10,937)
Exercise of stock options	943,505	1	7,610	—	—	7,611
Exercise of warrants	104,890	—	—	—	—	—
Claims settlement under Section 16(b)	—	—	2,151	—	—	2,151
Underwritten public offering of common stock, net of discounts, commissions and offering cost	8,385,417	8	188,875	—	—	188,883
Issuance of common stock upon private placement	2,000,000	2	36,435	—	—	36,437
Issuance of common stock under Employee Stock Purchase Plan	134,684	—	1,509	—	—	1,509
Vesting of restricted stock units, net of taxes withheld	274,563	—	(2,255)	—	—	(2,255)
Issuance of warrants	—	—	184	—	—	184
Stock-based compensation	—	—	17,620	—	—	17,620
Other comprehensive loss	—	—	—	(530)	—	(530)
Net loss	—	—	—	—	(127,290)	(127,290)
Balance, December 31, 2020	71,015,183	70	1,105,470	149	(992,306)	113,383
Exercise of stock options	1,304,347	3	11,017	—	—	11,020
Vesting of restricted stock units, net of taxes withheld	360,050	—	(4,449)	—	—	(4,449)
Net share settlement	—	—	(418)	—	—	(418)
Underwritten public offering of common stock, net of discounts, commissions and offering cost	11,500,000	11	296,894	—	—	296,905
Issuance of common stock upon private placement	511,182	—	15,144	—	—	15,144
Issuance of common stock under Employee Stock Purchase Plan	108,780	—	1,778	—	—	1,778
Stock-based compensation	—	—	26,832	—	—	26,832
Other comprehensive loss	—	—	—	(1,018)	—	(1,018)
Net loss	—	—	—	—	(215,314)	(215,314)
Balance, December 31, 2021	84,799,542	84	1,452,268	(869)	(1,207,620)	243,863
ASU 2020-06 adoption	—	—	(49,476)	—	10,581	(38,895)
Exercise of stock options	1,389,031	2	14,314	—	—	14,316
Issuance of common stock under restricted stock units	707,772	—	—	—	—	—
Shares withheld related to net share settlement of equity awards	(260,172)	—	(9,602)	—	—	(9,602)
Issuance of common stock under Employee Stock Purchase Plan	98,153	—	3,227	—	—	3,227
Induced conversion of convertible notes	8,071,343	8	(3,386)	—	—	(3,378)
Exercise of warrants	28,306	—	—	—	—	—
Settlement of capped call on 2026 Notes	—	—	26,392	—	—	26,392
Stock-based compensation	—	—	47,853	—	—	47,853
Other comprehensive loss	—	—	—	(2,721)	—	(2,721)
Net loss	—	—	—	—	(388,955)	(388,955)
Balance, December 31, 2022	94,833,975	$ 94	$ 1,481,590	$ (3,590)	$ (1,585,994)	$ (107,900)

The accompanying notes are an integral part of these consolidated financial statements.

CYTOKINETICS, INCORPORATED

CONSOLIDATED STATEMENTS OF CASH FLOWS

(In thousands)

	Years Ended December 31,		
	2022	**2021**	**2020**
Cash flows from operating activities:			
Net loss	$ (388,955)	$ (215,314)	$ (127,290)
Adjustments to reconcile net loss to net cash (used in) provided by operating activities:			
Non-cash interest expense on liabilities related to revenue participation right purchase agreement	31,858	13,004	22,792
Stock-based compensation expense	47,853	26,832	17,620
Non-cash lease expense	2,585	7,361	4,221
Impairment of right-of-use assets	—	2,844	—
Depreciation of property and equipment	5,814	2,276	1,831
Loss (gain) on investment, net	107	—	(573)
Interest receivable and amortization on investments	(4,710)	4,894	(1,194)
Non-cash interest expense related to debt	5,697	7,125	6,640
Loss on extinguishment of debt	2,693	—	—
Loss on inducement of convertible debt	22,246	—	—
Changes in operating assets and liabilities:			
Accounts receivable	56,672	(47,399)	743
Prepaid and other assets	(7,414)	(7,381)	(5,162)
Accounts payable	4,524	1,055	(110)
Accrued and other liabilities	10,844	15,060	7,117
Deferred revenue	(87,000)	—	87,000
Operating lease liabilities	1,728	43,472	(4,692)
Other non-current liabilities	(4,058)	3,649	—
Net cash (used in) provided by operating activities	(299,516)	(142,522)	8,943
Cash flows from investing activities:			
Purchases of investments	(855,393)	(525,042)	(435,825)
Maturities of investments	604,594	422,837	247,301
Sales of investments	—	3,300	3,061
Purchases of property and equipment	(11,335)	(48,872)	(11,052)
Net cash used in investing activities	(262,134)	(147,777)	(196,515)
Cash flows from financing activities:			
Repayment of finance lease liabilities	(944)	—	—
Repayment of term loan	(47,651)	—	—
Debt extinguishment costs	(2,409)	—	—
Repayment of convertible debt	(140,330)	—	—
Proceeds from issuance of convertible debt, net	523,586	—	—
Proceeds from public offerings of common stock, net of discounts, commissions and offering cost	—	296,905	188,883
Proceeds from private placement, net	—	15,144	36,225
Proceeds from 2022 RPI Transactions, net	149,581	—	—
Proceeds from issuance of common stock under equity incentive and stock purchase plans	17,543	12,380	9,120
Taxes paid related to net share settlement of equity awards	(9,602)	(4,449)	(2,255)
Claims settlement under Section 16(b)	—	—	2,151
Cash settlement of capped call options associated with 2026 Notes	26,392	—	—
Net cash provided by financing activities	516,166	319,980	234,124
Net (decrease) increase in cash, cash equivalents, and restricted cash equivalents	(45,484)	29,681	46,552
Cash, cash equivalents, and restricted cash equivalents, beginning of period	112,666	82,985	36,433
Cash, cash equivalents, and restricted cash equivalents, end of period	$ 67,182	$ 112,666	$ 82,985
Supplemental cash flow disclosures:			
Cash paid for interest	$ 15,165	$ 9,175	$ 9,620
Non-cash investing and financing activities:			
Right-of-use assets recognized in exchange for operating lease obligations	$ 10,904	$ 80,395	$ 1,106
Right-of-use assets recognized in exchange for finance lease obligations	$ 1,055	$ 1,294	$ —
Amounts unpaid for purchases of property and equipment	$ 621	$ 11,982	$ —
Issuance of common stock in connection with repurchase of convertible note	$ 317,123	$ —	$ —

The accompanying notes are an integral part of these consolidated financial statements.

CYTOKINETICS, INCORPORATED
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

Note 1 — Organization and Accounting Policies

Organization

Cytokinetics, Incorporated (the "Company", "we" or "our") was incorporated under the laws of the state of Delaware on August 5, 1997. We are a late-stage biopharmaceutical company focused on the discovery and development of novel small molecule therapeutics that modulate muscle function for the potential treatment of serious diseases and medical conditions.

Our financial statements contemplate the conduct of our operations in the normal course of business. We have incurred an accumulated deficit of approximately $1.6 billion since inception and there can be no assurance that we will attain profitability. We had a net loss of $389.0 million and net cash used in operations of $299.5 million for the year ended December 31, 2022. Cash, cash equivalents, and investments increased to $829.3 million as of December 31, 2022 from $623.7 million as of December 31, 2021. We anticipate that we will have operating losses and net cash outflows in future periods.

We are subject to risks common to late-stage biopharmaceutical companies including, but not limited to, development of new drug candidates, dependence on key personnel, and the ability to obtain additional capital as needed to fund our future plans. Our liquidity will be impaired if sufficient additional capital is not available on terms acceptable to us. To date, we have funded operations primarily through sales of our common stock, contract payments under our collaboration agreements, sales of future revenues and royalties, debt financing arrangements, government grants and interest income. Until we achieve profitable operations, we intend to continue to fund operations through payments from strategic collaborations, additional sales of equity securities, grants and debt financings. We have never generated revenues from commercial sales of our drugs and may not have drugs to market for at least several years, if ever. Our success is dependent on our ability to enter into new strategic collaborations and/or raise additional capital and to successfully develop and market one or more of our drug candidates. We cannot be certain that sufficient funds will be available from such a financing or through a collaborator when required or on satisfactory terms. Additionally, there can be no assurance that our drug candidates will be accepted in the marketplace or that any future products can be developed or manufactured at an acceptable cost. These factors could have a material adverse effect on our future financial results, financial position and cash flows.

Based on the current status of our research and development activities, we believe that our existing cash, cash equivalents, and investments will be sufficient to fund cash requirements for at least the next 12 months after the issuance of these consolidated financial statements. If, at any time, our prospects for financing our research and development programs decline, we may decide to reduce research and development expenses by delaying, discontinuing or reducing our funding of one or more of our research or development programs. Alternatively, we might raise funds through strategic collaborations, public or private financings or other arrangements. Such funding, if needed, may not be available on favorable terms, or at all. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosures of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting periods. We evaluate our estimates on an ongoing basis. We base our estimates on our historical experience and also on assumptions that we believe are reasonable; however, actual results could significantly differ from those estimates.

Basis of Presentation

The consolidated financial statements include the accounts of Cytokinetics, Incorporated and its wholly-owned subsidiaries and have been prepared in accordance with GAAP. Intercompany transactions and balances have been eliminated in consolidation. Certain prior period amounts have been reclassified to conform the prior period presentation to the current year.

Concentration of Credit Risk and Other Risks and Uncertainties

Financial instruments that potentially subject us to concentrations of risk consist principally of cash, cash equivalents, restricted cash equivalents, investments, and accounts receivable.

Our cash, cash equivalents, restricted cash equivalents, and investments held with large financial institutions in the United States and deposits may exceed the Federal Deposit Insurance Corporation's insurance limit.

Our exposure to credit risk associated with non-payment includes, but is not limited to, Astellas Pharma Inc. for co-funding one-third of the out-of-pocket clinical development costs which may be incurred in connection with Cytokinetics' Phase 3 clinical trial, COURAGE-ALS, of reldesemtiv in ALS up to a maximum contribution by Astellas of $12.0 million, to our strategic partner in China and Taiwan, Ji Xing, and RPI ICAV, to whom we sold a revenue interest in our net sales of pharmaceutical products containing aficamten under the RP Aficamten RPA, as further described in Note 11 below.

Drug candidates we develop may require approvals or clearances from the FDA or other regulatory agencies prior to commercial sales. There can be no assurance that our drug candidates will receive any of the required approvals or clearances. If we were to be denied approval, or clearance or any such approval or clearance was to be delayed, it would have a material adverse impact on us.

Cash, Cash Equivalents, and Restricted Cash Equivalents

We consider all highly liquid investments with a maturity of three months or less at the time of purchase to be cash equivalents, which consist of money market funds and repurchase agreements backed by U.S. Treasury securities. Repurchase agreements are collateralized by US Treasury securities for an amount not less than 102% of their value and are reported at a carrying value which approximates fair value due to their short duration.

A reconciliation of cash, cash equivalents, and restricted cash equivalents reported in our consolidated balance sheets to the amount reported within our consolidated statements of cash flows was as follows (in thousand):

	December 31,	
	2022	2021
Cash and cash equivalents	$ 65,582	$ 112,666
Restricted cash equivalents	1,600	—
Total cash, cash equivalents, and restricted cash equivalents as reported within our consolidated statement of cash flows	$ 67,182	$ 112,666

As of December 31, 2022, our restricted cash equivalents balance of $1.6 million is used to collateralize the letters of credit associated with our fixed and variable rate vehicle allowance and short-term car rental programs. The restricted cash equivalents are classified as other assets based on the remaining term of the underlying restriction. The letters of credit will lapse at the end of the respective contractual terms or upon termination of the arrangement.

Investments

Available-for-sale investments. Our investments consist of U.S. Treasury securities, U.S. and non-U.S. government agency bonds, commercial paper, global portfolio of corporate debt and money market funds. We designate all investments as available-for-sale and report them at fair value, based on quoted market prices, with unrealized gains and losses recorded in accumulated other comprehensive loss. The cost of securities sold is based on the specific-identification method. Investments with original maturities greater than three months and remaining maturities of one year or less are classified as short-term investments. Investments with remaining maturities greater than one year are classified as long-term investments.

All of our available-for-sale investments are subject to a periodic impairment review. For each available-for-sale investment whose fair value is below its amortized cost, we determine if the impairment is a result of a credit-related loss or other factors using both quantitative and qualitative factors. If the impairment is a result of a credit-related loss, we recognize an allowance for credit losses. If the impairment is not a result of a credit loss, we recognize the loss in other comprehensive loss.

Property and Equipment, net

Property and equipment are stated at cost less accumulated depreciation and are depreciated on a straight-line basis over the estimated useful lives of the related assets, which are generally three years for computer equipment and software, five years for laboratory equipment and office equipment, and seven years for furniture and fixtures. Amortization of leasehold improvements and finance lease right-of-use assets are computed using the straight-line method over the shorter of the remaining lease term or the estimated useful life of the related assets, typically ranging from three to twenty-two years. Upon sale or retirement of assets, the costs and related accumulated depreciation and amortization are removed from the balance sheet and the resulting gain or loss is reflected in operations.

Impairment of Long-lived Assets

We review long-lived assets, including property, equipment and right-of-use assets, for impairment whenever events or changes in business circumstances indicate that the carrying amount of the assets may not be fully recoverable. Impairment is measured as the amount by which the carrying amount of a long-lived asset exceeds its fair value. We would recognize an impairment loss when estimated undiscounted future cash flows expected to result from the use of the asset and its eventual disposition are less than its carrying amount.

Leases

We determine if the arrangement contains a lease at inception based on whether the contract conveys the right to control the use of an identified asset. The lease classification is determined at lease commencement, which is the date the underlying asset is available for use by the Company, and preliminary based on whether the arrangement is effectively a financed purchase of the underlying asset (finance lease) or not (operating lease). We determined the lease term at the commencement date by considering whether renewal options and termination options are reasonably assured of exercise. In addition to the fixed minimum lease payments required under the lease arrangements, certain leases include payments of operating expenses that may be revised based on the landlord's estimate. These variable payments are excluded from the lease payments used to determine the right-of-use asset and lease liability and are recognized when the associated activity occurs.

We recognize right-of-use assets and short-term and long-term lease liabilities on our consolidated balance sheets for operating leases. The right-of-use asset and short-term and long-term lease liabilities for finance leases are recognized in property and equipment, other current liabilities, and other non-current liabilities, respectively, on the consolidated balance sheets.

In determining the present value of lease payments, we estimated our incremental borrowing rate based on information available upon commencement. We base the lease liabilities on the present value of remaining lease payments over the remaining terms of the leases using an estimated rate of interest that we would pay to borrow equivalent funds on a collateralized basis at the lease commencement date. The initial right-of-use asset, for both operating and finance leases, is measured based on the lease liability adjusted for any initial direct costs, lease prepayments, and lease incentives.

We recognize rent expense for operating leases on a straight-line basis over the lease term in operating expenses on the consolidated statements of operations. Finance lease right-of-use assets are amortized on a straight-line basis over the shorter of the expected useful life or the lease term, and the carrying amount of the lease liability is adjusted to reflect interest, which is recorded in interest expense.

We exclude from our consolidated balance sheets recognition of leases having a term of 12 months or less (short-term leases). We account for lease and non-lease components as a single component for our operating leases.

Our operating leases consist of the facilities leases with KR Oyster Point 1, LLC and a facility located in Radnor, Pennsylvania, and our finance leases are for laboratory equipment.

Revenue Recognition

We recognize revenue when we transfer promised goods or services to customers in an amount that reflects the consideration for those goods or services. To recognize revenue from a contract with a customer, we:

(i) identify our contracts with our customers;

(ii) identify our distinct performance obligations in each contract;

(iii) determine the transaction price of each contract;

(iv) allocate the transaction price to the performance obligations; and

(v) recognize revenue as we satisfy our performance obligations.

At contract inception, we assess the goods or services promised within each contract and assess whether each promised good or service is distinct and determine those that are performance obligations. We then recognize as revenue the amount of the transaction price that is allocated to the respective performance obligation when (or as) the performance obligation is satisfied.

Collaborative Arrangements

We enter into collaborative arrangements with partners that typically include payment to us for one of more of the following: (i) license fees; (ii) milestone payments related to the achievement of developmental, regulatory, or commercial goals; (iii) royalties on net sales of licensed products; and (iv) research and development cost reimbursements. Each of these payments results in collaboration or other revenues. Where a portion of non-refundable up-front fees or other payments received are allocated to continuing performance obligations under the terms of a collaborative arrangement, they are recorded as deferred revenue and recognized as revenue when (or as) the underlying performance obligation is satisfied.

As part of the accounting for these arrangements, we must develop estimates and assumptions that require judgment to determine the underlying stand-alone selling price for each performance obligation which determines how the transaction price is allocated among the performance obligations. The stand-alone selling price may include such items as, forecasted revenues, development timelines, reimbursement rates for personnel costs, discount rates and probabilities of technical and regulatory success, to determine the transaction price to allocate to each performance obligation.

For our collaboration agreements that include more than one performance obligation, such as a license and/or milestones combined with a commitment to perform research and development services, we make judgments to 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. We evaluate our progress each reporting period and, if necessary, adjust the measure of a performance obligation and related revenue recognition.

License Fees: If a license to our intellectual property is determined to be distinct from the other performance obligations identified in the arrangement, we recognize revenues from non-refundable, up-front fees allocated to the license when the license is transferred to the licensee and the licensee is able to use and benefit from the license. For licenses that are bundled with other promises, we utilize judgment to 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, up-front license fees. We evaluate the measure of progress each reporting period and, if necessary, adjust the measure of performance and related revenue recognition.

Milestone Payments: We use judgment to determine whether a milestone is considered probable of being reached. Using the most likely amount method, we include the value of a milestone payment in the consideration for a contract at inception if we then conclude achieving the milestone is more likely than not. Otherwise, we exclude the value of a milestone payment from contract consideration at inception and recognize revenue for a milestone at a later date, when we judge that it is probable the milestone will be achieved. If we conclude it is probable that a significant revenue reversal would not occur, the associated milestone is included in the transaction price. We then allocate the transaction price to each performance obligation on a relative stand-alone selling price basis, for which we recognize revenue as or when the performance obligations under the contract are satisfied. At the end of each subsequent reporting period, we re-evaluate the probability of achievement of such milestones and any related constraint, and if necessary, adjust our estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect license, collaboration and other revenues and earnings in the period of adjustment.

Royalties: For contracts that include sales-based royalties, we recognize revenue at the later of (i) when the related sales occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied. To date, we have not recognized any royalty revenues resulting from contracts.

Research and Development Cost Reimbursements: Our joint programs with Astellas under the Astellas OSSA Agreement, and with Amgen under the Amgen Agreement (both of the Astellas OSSA Agreement and the Amgen Agreement having now been terminated), included promises of research and development services. We also entered into the Astellas FSRA Agreement on April 23, 2020. Under the Astellas FSRA Agreement, Astellas agreed to pay one-third of the out-of-pocket clinical development costs which may be incurred in connection with the Company's Phase 3 clinical trial of reldesemtiv in ALS, up to a maximum contribution by Astellas of $12.0 million. We determined that these services collectively were distinct from any licenses provided to Astellas and Amgen under such agreements, and as such, these services were accounted for as a separate performance obligation recorded over time. We recognized revenue for these services as the performance obligations are satisfied, which we estimated using internal research and development costs incurred.

Accrued Research and Development Expenditures

Clinical trial costs are a component of research and development expense. The Company accrues and expenses clinical trial activities performed by third parties based upon actual work completed in accordance with agreements established with clinical research and manufacturing organizations and clinical sites. The Company determines the actual costs through monitoring patient enrollment, discussions with internal personnel and external service providers regarding the progress or stage of completion of trials or services and the agreed-upon fee to be paid for such services.

Revenue Participation Right Purchase Agreements

We have entered into certain revenue participation right purchase agreements with certain investors, pursuant to which such investors purchased rights to royalties from certain revenue streams in exchange for consideration. We typically account for such agreements as debt to be amortized under the effective interest rate method over the life of the related royalty stream, when we have continuing involvement with the underlying R&D. We typically account for such agreements as deferred income to be amortized under the units-of-revenue method, when there is no continuing involvement with the underlying R&D.

Revenue participation right purchase agreements are recognized using significant unobservable inputs. These inputs are derived using internal management estimates developed based on third party data and reflect management's judgements, current market conditions surrounding competing products, and forecasts. We will periodically assess the amount and timing of expected royalty payments and account for any changes in such estimates on a prospective basis.

Research and Development Expenditures

Research and development costs are charged to operations as incurred. Research and development expenses consist primarily of clinical manufacturing costs, preclinical study expenses, consulting and other third-party costs, employee compensation, supplies and materials, allocation of overhead and occupancy costs, facilities costs and depreciation of equipment.

Income Taxes

We account for income taxes under the asset and liability method. Under this method, deferred tax assets and liabilities are determined based on the difference between the financial statement and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to affect taxable income. Valuation allowances are established when necessary to reduce deferred tax assets to the amounts expected to be realized.

We recognize uncertain tax positions taken or expected to be taken on a tax return. Tax positions are initially recognized when it is more likely than not that the position will be sustained upon examination by the tax authorities. Such tax positions are initially and subsequently measured as the largest amount of tax benefit that is more likely than not of being realized upon ultimate settlement with the tax authority assuming full knowledge of the position and relevant facts.

We recognize interest accrued related to unrecognized tax benefits and penalties as income tax expense.

Stock-Based Compensation

We maintain equity incentive plans under which incentive stock options may be granted to employees and nonqualified stock options, restricted stock awards, performance-based stock units and stock appreciation rights may be granted to employees, directors, consultants and advisors. In addition, we maintain an ESPP under which employees may purchase shares of our common stock through payroll deductions.

Stock-based compensation expense related to stock options granted to employees and directors is recognized based on the grant date estimated fair values using the Black Scholes option pricing model. The value of the portion of the award that is ultimately expected to vest is recognized as expense ratably over the requisite service period.

Stock-based compensation expense related to performance-based stock units granted to employees is recognized based on the grant-date fair value of each award and recorded as expense over the vesting period using the ratable method when the underlying performance conditions are deemed probable.

Stock-based compensation expense related to the ESPP is recognized based on the fair value of each award estimated on the first day of the offering period using the Black Scholes option pricing model and recorded as expense over the service period using the straight-line method.

Recent Accounting Pronouncements

In August 2020, the FASB issued ASU 2020-06. Under ASU 2020-06 the embedded conversion features are no longer separated from the host contract for convertible instruments with conversion features that are not required to be accounted for as derivatives under Topic 815, Derivatives and Hedging, or that do not result in substantial premiums accounted for as paid-in capital. Consequently, a convertible debt instrument is accounted for as a single liability measured at its amortized cost and convertible preferred stock is accounted for as a single equity instrument measured at its historical cost, as long as no other features require bifurcation and recognition as derivatives.

We adopted this new guidance using the modified retrospective method as of January 1, 2022, with respect to our 2026 Notes. The cumulative effect of initially applying the new standard was recognized as an adjustment to accumulated deficit. The following table summarizes the adjustments made to our consolidated balance sheet as of January 1, 2022, upon adoption of the new standard (in 000's):

Balance sheet account description	Ending Balance as of December 31, 2021	ASU 2020-06 Adjustments	Beginning Balance as of January 1, 2022
Convertible notes, net	$ 95,471	$ 38,895	$ 134,366
Additional paid-in capital	1,452,268	(49,476)	1,402,792
Accumulated deficit	(1,207,620)	10,581	(1,197,039)

The adoption of this new guidance resulted in an increase in the carrying value of the 2026 Notes to reflect the full principal amount of the convertible notes outstanding, net of issuance costs, a decrease in additional paid-in capital to remove the equity component separately recorded for the conversion feature associated with the convertible notes, a cumulative-effect adjustment to the beginning balance of our accumulated deficit as of January 1, 2022 to reverse the accretion of discount that resulted from the bifurcation of the equity component of the 2026 Notes, and a reversal of the related deferred tax liability of $8.3 million with a corresponding increase in our deferred tax asset valuation allowance. The adoption of this new guidance reduced non-cash interest expense for the year ending December 31, 2022 and will continue to do so until the 2026 Notes have been settled. The remaining debt issuance costs will continue to be amortized over the term of the notes.

We have recognized $3.6 million of interest expense of the 2026 Notes in 2022 which is $3.3 million less than under the previous accounting standards in 2022. Without the adoption of ASU 2020-06, our reported net loss would have increased by $3.3 million in 2022. Without the adoption of ASU 2020-06, our reported net loss per share would have increased by $0.04 per share in 2022.

On July 6, 2022, the Company issued the 2027 Notes and partially repurchased the 2026 Notes as further described in Note 7 – "Debt." ASU 2020-06 was applied to the 2027 Notes from the moment of issuance, and thus the above adjustments apply only to the 2026 Notes.

Note 2 — Net Loss Per Share

Basic net loss per share is computed by dividing net loss by the weighted average number of vested common shares outstanding during the period. Diluted net loss per share is computed by giving effect to all potentially dilutive common shares, including outstanding stock options, unvested restricted stock, warrants, convertible preferred stock and shares issuable under our ESPP, during the period using the treasury stock method and convertible notes using the if-converted method.

The following instruments were excluded from the computation of diluted net loss per share for the periods presented because their effect would have been antidilutive (in thousands):

	Years Ended December 31,		
	2022	2021	2020
Options to purchase common stock	10,992	9,373	8,510
Warrants to purchase common stock	13	48	48
Restricted stock and performance units	1,260	1,415	1,117
Shares issuable related to the ESPP	13	8	12
Shares issuable upon conversion of 2026 Notes	2,554	16,675	16,675
Shares issuable upon conversion of 2027 Notes	10,572	—	—
Total shares	25,404	27,519	26,362

Note 3 — Research and Development Arrangements

2021 Ji Xing and RTW Transactions

In December 2021, we entered into the 2021 RTW Transactions with parties that were at the time of our entry into the 2021 RTW Transactions affiliated and in contemplation of one another and, accordingly, we have assessed the accounting for these transactions in the aggregate. Unconstrained arrangement consideration under the 2021 RTW Transactions totaled $70.0 million and was allocated in accordance with ASC 820, *Fair Value Measurement,* and ASC 606, *Revenue from Contracts with Customers,* as follows (in thousands):

	Allocated Consideration
Units of Accounting:	
License and collaboration	$ 54,856
Common stock (fair value)	15,144
Total consideration	$ 70,000

Ji Xing Omecamtiv Mecarbil License and Collaboration Agreement

On December 20, 2021, we entered into the Ji Xing OM License Agreement, pursuant to which we granted to Ji Xing an exclusive license to develop and commercialize omecamtiv mecarbil in China and Taiwan. Under the terms of the Ji Xing OM License Agreement, we are the beneficiary of a nonrefundable $50.0 million payment obligation from Ji Xing comprised of a $40.0 million payment as consideration for the rights granted by us to Ji Xing and $10.0 million attributable to our having submitted to the FDA an NDA for omecamtiv mecarbil. The $50.0 million payment was received by the Company in January 2022. We may be eligible to receive from Ji Xing additional payments totaling up to $330.0 million for the achievement of certain commercial milestone events in connection to omecamtiv mecarbil. In addition, Ji Xing will pay us tiered royalties in the mid-teens to the low twenties range on the net sales of pharmaceutical products containing omecamtiv mecarbil in China and Taiwan, subject to certain reductions for generic competition, patent expiration and payments for licenses to third party patents.

Ji Xing will be responsible for the development and commercialization of omecamtiv mecarbil at its own cost and is required to use diligent efforts to develop and commercialize omecamtiv mecarbil in China and Taiwan. The development of omecamtiv mecarbil will be initially focused on HFrEF, and Ji Xing will have the opportunity to participate in Cytokinetics' global clinical trials of omecamtiv mecarbil. Cytokinetics will supply omecamtiv mecarbil to Ji Xing either as a finished product or as an active pharmaceutical ingredient. Ji Xing may reimburse Cytokinetics for certain costs related to development and supply activities that we performed on their behalf.

The Ji Xing OM License Agreement, unless terminated earlier, will continue on a market-by-market basis until expiration of the relevant royalty term. Ji Xing has the right to terminate the Ji Xing OM License Agreement for convenience. Each party may terminate the Ji Xing OM License Agreement for the other party's uncured material breach, insolvency, or failure to perform due to extended force majeure events. Cytokinetics may also terminate the Ji Xing OM License Agreement if Ji Xing challenges Cytokinetics' patents or undergoes certain change of control transactions. Rights granted to Ji Xing in relation to omecamtiv mecarbil will revert to Cytokinetics upon termination, and, under certain circumstances, subject to a low single digit royalty payment by the Company to Ji Xing on the net sales of the products containing the compound omecamtiv mecarbil in China and Taiwan. We assessed this arrangement in accordance with ASC 606 and concluded that there is one performance obligation relating to the license of functional intellectual property. The performance obligation was satisfied, and we recognized the residual allocation of arrangement consideration as revenue of $54.9 million for 2021. Due to the nature of development, including the inherent risk of development and approval by regulatory authorities, we are unable to estimate if and when the development milestone payments could be achieved or become due and, accordingly, we consider the milestone payments to be fully constrained and excluded any potential milestone payments from the initial transaction price.

The consideration related to sales-based milestone payments, including royalties, will be recognized when the related sales occur under the sales- and usage-based royalty exception as these amounts have been determined to relate predominantly to the license.

We re-evaluate the probability of achievement of development milestones and any related constraints each reporting period. We will include consideration, without constraint, in the transaction price to the extent it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur.

Common Stock Purchase Agreements

On December 20, 2021, as part of the 2021 RTW Transactions, we entered into common stock purchase agreements with each of the RTW Investors. These common stock purchase agreements provided for the sale and issuance of an aggregate of 511,182 shares of our common stock at a price per share of $39.125 and an aggregate purchase price of $20.0 million. The closing occurred on December 20, 2021. The RTW Investors have agreed to certain trading and other restrictions with respect to the shares of common stock they purchased pursuant to these agreements, including a restriction on sales or other transfers of the shares, subject to certain exceptions, for a period of one year from the closing date. The restrictions resulted in a premium paid by the RTW Investors of $4.9 million, which represents the excess amount paid over the fair value of the shares of common stock purchased. The premium was determined by analyzing the restrictions discount applied to the closing stock price as of December 20, 2021, which is a Level 2 fair value input. The cash received less the calculated premium is the $15.1 million fair value of the common stock recorded.

2020 Ji Xing and RTW Transactions

On July 14, 2020, we entered in the 2020 RTW Transactions, as described below, with RTW Royalty Holdings and Ji Xing , related to aficamten, our proprietary small molecule cardiac myosin inhibitor product, a novel cardiac myosin inhibitor, and other assets. The 2020 RTW Transactions include entering into a licensing and collaboration agreement with Ji Xing, the sale of Cytokinetics common stock to the RTW Investors, an agreement to sell to RTW Royalty Holdings our interest in certain future royalties on net sales of products containing the compound mavacamten that are or may be developed or commercialized by Bristol-Myers Squibb Company (formerly by MyoKardia, Inc.), including CAMZYOS™ (mavacamten), and the ability for the Company to obtain additional funding in the future from RTW Royalty Holdings, upon the achievement of certain clinical trial milestones, in exchange for future royalty payments as further discussed below. As a result, we have received and expect to receive a combination of license fees, milestone revenues and sale proceeds from the RTW Investors, RTW Royalty Holdings and Ji Xing.

The 2020 RTW Transactions were entered into with parties that were at the time of our entry into the 2020 RTW Transactions affiliated and in contemplation of one another and, accordingly, we have assessed the accounting for these transactions in the aggregate. We concluded that there were three units of accounting in the 2020 RTW Transactions as further described below. The Company allocated the total consideration in accordance with ASC 820 and ASC 606 as follows (in thousands):

	Allocated Consideration
Units of Accounting:	
License and collaboration (residual)	$ 36,501
Royalty (fair value)	87,000
Common stock (fair value)	36,499
Total consideration	$ 160,000

Ji Xing Aficamten License and Collaboration Agreement

On July 14, 2020, we entered into the Ji Xing Aficamten License Agreement with Ji Xing, pursuant to which we granted to Ji Xing an exclusive license to develop and commercialize aficamten in China and Taiwan. Under the terms of the Ji Xing Aficamten License Agreement, we received from Ji Xing a nonrefundable upfront payment of $25.0 million. We may be eligible to receive from Ji Xing milestone payments totaling up to $200.0 million for the achievement of certain development and commercial milestone events in connection to aficamten in the field of oHCM and/or nHCM and other indications. In addition, Ji Xing will pay us tiered royalties in the low-to-high teens range on the net sales of the products containing aficamten in China and Taiwan, subject to certain reductions for generic competition, patent expiration and payments for licenses to third party patents.

Ji Xing will be responsible for the development and commercialization of aficamten at its own cost and is required to use diligent efforts to develop and commercialize aficamten in China and Taiwan. The development of aficamten will be initially focused on HCM, and Ji Xing will have the opportunity to participate in Cytokinetics' global pivotal clinical trials of aficamten. Cytokinetics or a designated supplier will supply aficamten to Ji Xing either as a finished product or as an active pharmaceutical ingredient.

The Ji Xing Aficamten License Agreement, unless terminated earlier, will continue on a market-by-market basis until expiration of the relevant royalty term. Ji Xing has the right to terminate the Ji Xing Aficamten License Agreement for convenience. Each party may terminate the Ji Xing Aficamten License Agreement for the other party's uncured material breach, insolvency, or failure to perform due to extended force majeure events. Cytokinetics may also terminate the Ji Xing Aficamten License Agreement if Ji Xing challenges Cytokinetics' patents or undergoes certain change of control transactions. Rights granted to Ji Xing in relation to aficamten will revert to Cytokinetics upon termination, and, under certain circumstances, subject to a low single digit royalty payment by the Company to Ji Xing on the net sales of the products containing the compound aficamten in China and Taiwan.

We assessed this arrangement in accordance with ASC 606 and concluded that there is one performance obligation relating to the license of functional intellectual property. The performance obligation was satisfied, and we recognized the residual allocation of arrangement consideration as revenue of $36.5 million for 2020. No license revenue was recognized in 2021 related to the Ji Xing Aficamten License Agreement. Due to the nature of development, including the inherent risk of development and approval by regulatory authorities, we are unable to estimate if and when the development milestone payments could be achieved or become due and, accordingly, we consider the milestone payments to be fully constrained and exclude the milestone payments from the initial transaction price.

The consideration related to sales-based milestone payments, including royalties, will be recognized when the related sales occur under the sales and usage-based royalty exception of ASC 606 as these amounts have been determined to relate predominantly to the license.

We re-evaluate the probability of achievement of development milestones and any related constraints each reporting period. We will include consideration, without constraint, in the transaction price to the extent it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur.

We recognized a $5.0 million milestone from Ji Xing during the third quarter of 2021 for initiation of a phase 3 clinical trial for aficamten in oHCM. Although our contractual right to payment had not arisen under the Ji Xing Aficamten License Agreement, we determined recognition of the milestone in accordance with ASC 606 during the third quarter of 2021 was appropriate based on our expected initiation of a phase 3 clinical trial of aficamten in oHCM and was recorded as a corresponding contract asset in other current assets in our consolidated balance sheet as of December 31, 2021.

Royalty Purchase Agreement

On July 14, 2020, we entered the RTW Royalty Purchase Agreement with RTW Royalty Holdings, pursuant to which we sold our Mavacamten Royalty, under the Research Collaboration Agreement, dated August 24, 2012, between us and MyoKardia, Inc. to RTW Royalty Holdings for a one-time payment of $85.0 million. The RTW Royalty Purchase Agreement transaction closed on November 13, 2020. On March 31, 2021, RTW Royalty Holdings assigned its rights and obligations under the RTW Royalty Purchase Agreement to its affiliate, RTW ICAV. We understand that on April 18, 2022, RTW ICAV and MyoKardia, Inc. entered into agreements, which purported to assign all of RTW ICAV's rights, title and interest to the Mavacamten Royalty to MyoKardia, Inc., and on April 25, 2022, we entered into a tripartite agreement with RTW ICAV and MyoKardia, Inc. acknowledging the release and discharge of any further obligations by us or MyoKardia, Inc. in connection to the Mavacamten Royalty.

The allocation of the consideration for the 2020 RTW Transactions resulted in $87.0 million being allocated to the RTW Royalty Purchase Agreement representing its fair value. The fair value was determined using an income approach method based on management's estimates of the discounted cash flows to be received over the term of the related royalty agreement, which are Level 3 fair value inputs. Management's estimates included significant unobservable inputs. These inputs are derived using internal management estimates developed based on third party data and reflect management's judgements, current market conditions surrounding competing products, and forecasts. The significant unobservable inputs include the estimated patient population, estimated selling price, estimated peak sales and sales ramp, the expected term of the royalty stream, and timing of the expected launch. The $87.0 million was initially recorded as deferred revenue. On April 25, 2022, as discussed above, we entered into a tripartite agreement with RTW ICAV and MyoKardia, Inc. acknowledging the release and discharge of any further obligations by us or MyoKardia, Inc. in connection to the Mavacamten Royalty. As a result of the full extinguishment of the Mavacamten Royalty, we recognized revenue of $87.0 million.

Common Stock Purchase Agreements

On July 14, 2020, we entered into common stock purchase agreements with each of the RTW Investors. These common stock purchase agreements provided for the sale and issuance of an aggregate of 2.0 million shares of common stock of Cytokinetics at a price per share of $25.00 and an aggregate purchase price of $50.0 million. The closing occurred on July 14, 2020. The RTW Investors have agreed to certain trading and other restrictions with respect to the shares of common stock they purchased pursuant to these agreements, including a restriction on sales or other transfers of the shares, subject to certain exceptions, for a period of two years from the closing date, which period will be extended if certain conditions are met. The restrictions resulted in a premium paid by RTW investors of $13.5 million which represents the excess amount paid over the fair value of the shares of common stock purchased. The premium was determined by analyzing the holding period discount applied to the 30-day average stock price as of July 14, 2020, which is a Level 2 fair value input. The cash received less the calculated premium is the $36.5 million fair value of the common stock recorded.

Funding Agreement

During July 2020, we also entered into a Funding Agreement (the "Funding Agreement") with RTW Royalty Holdings. Pursuant to the Funding Agreement, RTW Royalty Holdings had committed to provide up to $90.0 million to fund our development and commercialization of aficamten in nHCM and oHCM.

On January 7, 2022, we announced that we had elected to unilaterally terminate the Funding Agreement in connection with our entry into the RP Aficamten RPA (as defined below). At the time of its termination, we had not exercised any rights to sell any revenue interest in aficamten under the Funding Agreement.

Astellas

Our strategic alliance with Astellas to advance novel therapies for diseases and medical conditions associated with skeletal muscle impairment and weakness commenced in 2013 under the Astellas Agreement.

On April 23, 2020, we and Astellas entered into the two agreements referenced below which, taken together, amend and restate the Company's research, development and commercialization collaboration with Astellas under the Astellas Agreement.

Fast Skeletal Regulatory Activator Agreement

The Company and Astellas entered into the Astellas FSRA Agreement on April 23, 2020. As a result of the Astellas FSRA Agreement, the Company will now have exclusive control and responsibility for the Company's future development and commercialization of reldesemtiv, CK-601 and other FSRA compounds and products, and accordingly, Astellas has agreed to terminate its license to all FSRA compounds and related products.

Under the Astellas FSRA Agreement, Astellas agreed to pay one-third of the out-of-pocket clinical development costs which may be incurred in connection with the Company's Phase 3 clinical trial of reldesemtiv in ALS, up to a maximum contribution by Astellas of $12 million. As of December 31, 2022, Astellas has reimbursed us $9.3 million. In addition, Astellas agreed to non-cash contributions to the Company, which include the transfer of its existing inventories of active pharmaceutical ingredient of reldesemtiv and CK-601. Astellas has also agreed to the continued conduct of ongoing stability studies pertaining to such existing inventories of active pharmaceutical ingredient, at Astellas' cost. In exchange, the Company will pay Astellas a low- to mid- single digit royalty on sales of reldesemtiv in the United States, Canada, United Kingdom and the E.U. until the later of (i) ten years following the first commercial sale of such product in a major market country, or (ii) December 31, 2034, subject to certain royalty reduction provisions. The Company will not owe Astellas royalties on sales of reldesemtiv in any other country, or on the sale of any FSRA compounds or related products other than reldesemtiv.

License and Collaboration Agreement for Other Skeletal Sarcomere Activators

The Company and Astellas also entered into the Astellas OSSA Agreement, which is an amendment and restatement of the Astellas Agreement and removes the FSRA compounds and related products from the collaboration.

On April 27, 2021, we received written notice of termination from Astellas of the Astellas OSSA Agreement. The termination of the Astellas OSSA Agreement was effective November 1, 2021.

We recognized research revenue for reimbursements from Astellas of internal costs of certain full-time employee equivalents, supporting collaborative research and development programs, and of other costs related to those programs through March 31, 2021 when the research term of the Astellas OSSA Agreement expired.

Research and development revenue from Astellas for 2022, 2021, and 2020 was $5.7 million, $3.2 million, and $6.6 million, respectively.

We had no accounts receivable from Astellas as of December 31, 2022. We had accounts receivable from Astellas of $1.8 million as of December 31, 2021.

Amgen

On November 23, 2020, we received written notice of termination from Amgen of the Amgen Agreement pertaining to the discovery, development and commercialization of novel small molecule therapeutics, including omecamtiv mecarbil, a novel cardiac myosin activator, and CK-136 (formerly AMG 594), a novel cardiac troponin activator. The termination of the Amgen Agreement was effective May 20, 2021.

We recognized research and development revenue for reimbursements from Amgen of both internal costs of certain full-time employee equivalents and other costs related to the Amgen Agreement, which terminated effective May 20, 2021. There was no research and development revenue from Amgen in 2022. Research and development revenue from Amgen was $7.4 million in 2021 and $10.0 million in 2020 and consists of reimbursement of costs we incurred related to METEORIC-HF.

Note 4 — Fair Value Measurements

We value our financial assets and liabilities at fair value, defined as the price that would be received for assets when sold or paid to transfer a liability in an orderly transaction between market participants at the measurement date (exit price). We utilize market data or assumptions that we believe market participants would use in pricing the asset or liability, including assumptions about risk and the risks inherent in the inputs to the valuation technique. These inputs can be readily observable, market corroborated or generally unobservable.

We primarily apply the market approach for recurring fair value measurements and endeavor to utilize the best information reasonably available. Accordingly, we use valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs to the extent possible and consider the security issuers' and the third-party issuers' credit risk in our assessment of fair value.

We classify fair value based on the observability of those inputs using a hierarchy that prioritizes the inputs used to measure fair value. The hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurement) and the lowest priority to unobservable inputs (Level 3 measurement):

Level 1 — Observable inputs, such as quoted prices in active markets for identical assets or liabilities;

Level 2 — Inputs, other than the quoted prices in active markets, that are observable either directly or through corroboration with observable market data; and

Level 3 — Unobservable inputs, for which there is little or no market data for the assets or liabilities, such as internally-developed valuation models.

Fair Value of Financial Assets

The follow tables set forth the fair value of our financial assets, which consist of cash equivalents and investments classified as available-for-sale securities, that were measured on a recurring basis (in thousands):

		December 31, 2022			
	Fair Value Hierarchy Level	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Money market funds	Level 1	$ 45,887	$ —	$ —	$ 45,887
U.S. Treasury securities	Level 1	172,568	—	(1,102)	171,466
U.S. Treasury securities backed repurchase agreements	Level 2	16,003	—	—	16,003
U.S. and non-U.S. government agency bonds	Level 2	136,773	12	(889)	135,896
Commercial paper	Level 2	329,359	28	(431)	328,956
U.S. and non-U.S. corporate obligations	Level 2	128,594	—	(1,209)	127,385
		$ 829,184	$ 40	$ (3,631)	$ 825,593

		December 31, 2021			
	Fair Value Hierarchy Level	Amortized Cost	Unrealized Gains	Unrealized Losses	Fair Value
Money market funds	Level 1	$ 115,937	$ —	$ —	$ 115,937
U.S. Treasury securities	Level 1	133,498	1	(268)	133,231
U.S. government agency bonds	Level 2	33,489	—	(53)	33,436
Commercial paper	Level 2	169,622	6	(19)	169,609
U.S. and non-U.S. corporate obligations	Level 2	175,282	—	(536)	174,746
		$ 627,828	$ 7	$ (876)	$ 626,959

The available-for-sale securities in our consolidated balance sheet are as follows (in thousands):

	December 31, 2022	December 31, 2021
Cash equivalents	$ 61,890	$ 115,937
Short-term investments	716,995	358,972
Long-term investments	46,708	152,050
	$ 825,593	$ 626,959

Interest income was $11.4 million, $1.0 million, and $5.3 million in 2022, 2021, and 2020, respectively.

No credit losses on debt securities were recognized in either 2022 or 2021. In its evaluation to determine expected credit losses, management considered all available historical and current information, expectations of future economic conditions, the type of security, the credit rating of the security, and the size of the loss position, as well as other relevant information. The Company does not intend to sell, and is unlikely to be required to sell, any of these available-for-sale investments before their effective maturity or market price recovery.

The carrying amount of our accounts receivable and accounts payable approximate fair value due to the short-term nature of these instruments.

There were no transfers between Level 1, Level 2, and Level 3 during the periods presented.

Note 5 — Balance Sheet Components

Our property and equipment consisted of (in thousands):

	December 31,	
	2022	2021
Property and equipment, net:		
Laboratory equipment	$ 18,490	$ 18,837
Computer equipment and software	3,900	4,605
Office equipment, furniture and fixtures	6,056	4,042
Leasehold improvements	65,912	60,343
Construction in progress	741	224
Right-of-use assets, finance lease	2,448	1,409
Total property and equipment	97,547	89,460
Less: Accumulated depreciation	(17,094)	(16,189)
	$ 80,453	$ 73,271

Depreciation expense was $5.8 million, $2.3 million, and $1.8 million for 2022, 2021, and 2020, respectively.

Our accrued liabilities were as follows (in thousands):

	December 31,	
	2022	2021
Accrued liabilities:		
Clinical and preclinical costs	$ 16,105	$ 13,872
Compensation related	21,767	14,930
Other accrued expenses	6,224	5,568
Total accrued liabilities	$ 44,096	$ 34,370

We sponsor a 401(k) defined contribution plan covering all employees and contributed $1.8 million, $1.1 million, and $0.9 million to this plan in 2022, 2021, and 2020 respectively.

Note 6 — Agreements with Royalty Pharma

On January 7, 2022, we announced that we had entered into the 2022 RPI Transactions with affiliates of Royalty Pharma International plc.

The RP Loan Agreement and the RP Aficamten RPA described below, are determined to be debt instruments subsequently measured at amortized cost and were entered into with parties that were at the time of our entry into the 2022 RPI Transactions affiliated and in contemplation of one another. We used the relative fair value method and made separate estimates of the fair value of each freestanding financial instrument and then allocated the proceeds in proportion to those fair value amounts. Arrangement consideration for the RP Loan Agreement and the RP Aficamten RPA totaled $150 million, consisting of the two $50 million upfront payments for the signing of the RP Loan Agreement and the RP Aficamten RPA and milestone of $50 million for initiation of the first pivotal trial in oHCM for aficamten that was deemed probable at the signing of the agreements.

The total consideration was allocated as follows (in thousands):

	Fair Value	Proceeds	Allocation
Units of Accounting:			
Revenue Participation Right Purchase Agreement	$ 69,498	$ 100,000	$ 89,571
Development Funding Loan Agreement	46,887	50,000	60,429
Total consideration	$ 116,385	$ 150,000	$ 150,000

2022 RP Loan Agreement

Under the RP Loan Agreement, we are entitled to receive up to $300.0 million in term loans, $50.0 million of which was disbursed to us on closing and the remaining $250.0 million available to us upon our satisfaction of customary disbursement conditions and certain development conditions by specific deadlines, as follows:

- $50.0 million of tranche 2 term loans during the one year period following the receipt on or prior to March 31, 2023 of marketing approval from FDA of omecamtiv mecarbil;
- $25.0 million of tranche 3 term loans during the one year period following the commercial availability of a diagnostic test measuring levels of omecamtiv mecarbil to support the final FDA label language applicable to such drug, subject to such commercial availability and the conditions to the tranche 2 term loans having occurred on or prior to March 31, 2023;
- $75.0 million of tranche 4 term loans during the one year period following the receipt on or prior to September 30, 2024 of positive results from SEQUOIA-HCM, the Phase 3 trial for aficamten; and
- $100.0 million of tranche 5 term loans during the one year period following the acceptance by the FDA on or prior to March 31, 2025 of an NDA for aficamten, subject to the conditions to the tranche 4 term loans having occurred on or prior to September 30, 2024.

As a result of our receipt of a CRL on February 28, 2023, in connection to our NDA for omecamtiv mecarbil, we do not expect to satisfy the conditions to the availability of the tranche 2 and tranche 3 loans under the RP Loan Agreement.

Each term loan under the RP Loan Agreement matures on the 10 year anniversary of the funding date for such term loan and is repayable in quarterly installments of principal, interest and fees commencing on the last business day of the seventh full calendar quarter following the calendar quarter of the applicable funding date for such term loan, with the aggregate amount payable in respect of each term loan (including interest and other applicable fees) equal to 190% of the principal amount of the term loan for the tranche 1, tranche 4 and tranche 5 term loans and 200% of the principal amount of the term loan for tranche 2 and tranche 3 term loans (such amount with respect to each term loan, "Final Payment Amount"). We accounted for amounts drawn under the RP Loan Agreement using the effective interest method which resulted in an effective interest rate of 7.65% over the ten-year term. As of the date of the prepayment or maturity of the term loan (or the date such prepayment or repayment is required to be paid), we will be required to pay an additional amount equal to $34.6 million accreted over the term of the loan.

We may prepay the term loans in full (but not in part) at any time at our option by paying an amount equal to the unpaid portion of Final Payment Amount for the outstanding term loans under the RP Loan Agreement; provided that if the conditions for either the tranche 4 term loans or the tranche 5 term loans have been met, we must have borrowed at least $50 million principal amount of the tranche 4 or 5 term loans. In addition, the term loans under the RP Loan Agreement are repayable in full at the option of either us or the lender in an amount equal to the unpaid portion of Final Payment Amount for the outstanding term loans upon a change of control of Cytokinetics.

Future minimum payments under the existing borrowing under RP Loan Agreement are (in thousands):

Years ending December 31:		
2023	$	1,440
2024		10,080
2025		11,520
2026		11,520
2027		11,520
Thereafter		48,960
Future minimum payments		95,040
Less: Unamortized interest and loan costs		(30,272)
Term Loan, net	$	64,768

As of December 31, 2022, the fair value of our RP Loan approximated its carrying value of $64.8 million based upon a market observable interest rate, which is a Level 2 input.

Interest expense for the RP Loan Agreement was $4.8 million in 2022.

Concurrent with our entry into the RP Loan Agreement, we terminated the Term Loan Agreement with Silicon Valley Bank and Oxford Finance LLC and repaid all amounts outstanding thereunder as further described in Note 7.

2022 RP Aficamten Royalty Purchase Agreement

In addition, on January 7, 2022, we entered into the RP Aficamten RPA with RPI ICAV, pursuant to which RPI ICAV purchased rights to certain revenue streams from net sales of pharmaceutical products containing aficamten by us, our affiliates and our licensees in exchange for up to $150.0 million in consideration, $50.0 million of which was paid on the closing date, $50.0 million of which was paid to us in March 2022 following the initiation of the first pivotal trial in oHCM for aficamten and $50.0 million of which is payable following the initiation of the first pivotal clinical trial in nHCM for aficamten. The RP Aficamten RPA also provides that the parties will negotiate terms for additional funding if we achieve proof of concept results in certain other indications for aficamten, with a reduction in the applicable royalty if we and RPI ICAV fail to agree on such terms in certain circumstances.

Pursuant to the RP Aficamten RPA, RPI ICAV purchased the right to receive a percentage of net sales equal to 4.5% for annual worldwide net sales of pharmaceutical products containing aficamten up to $1 billion and 3.5% for annual worldwide net sales of pharmaceutical products containing aficamten in excess of $1 billion, subject to reduction in certain circumstances (the "RP Aficamten Liability").

We account for the RP Aficamten Liability as a liability primarily because we have significant continuing involvement in generating the related revenue stream from which the liability will be repaid. If and when aficamten is commercialized and royalties become due, we will recognize the portion of royalties paid to RPI ICAV as a decrease to the RP Aficamten Liability and a corresponding reduction in cash.

The carrying amount of the RP Aficamten Liability is based on our estimate of the future royalties to be paid to RPI ICAV over the life of the arrangement as discounted using an imputed rate of interest. The imputed rate of interest on the unamortized portion of the RP Aficamten Liability was approximately 22.4% as of December 31, 2022.

During the third and fourth quarter of 2022, we updated our analyses of the RP Aficamten RPA to reflect our assumptions resulting from ongoing global market research and to reflect other adjustments in connection with our anticipated commercialization. Our estimates regarding the amount of future royalty payments under the RP Aficamten RPA increased due to changes in management's estimates of unobservable inputs related to market conditions and timing. The adjustment is accounted for on a prospective basis in our liability calculation and resulted in changes in our imputed interest rate from 11.7% in the second quarter of 2022 to 22.4% in the fourth quarter of 2022. We recognized $15.5 million of non-cash interest expense in 2022 related to the RP Aficamten RPA. In 2022, the change in estimate had no impact on revenue and increased the net loss by $5.3 million. The change in accounting estimate increased the net loss per share by $0.06 in 2022.

2017 RP Omecamtiv Mecarbil Royalty Purchase Agreement

In February 2017, we entered into the RP OM RPA pursuant to which we sold a portion of our right to receive royalties from Amgen on future net sales of omecamtiv mecarbil to RPFT for a one-time payment of $90 million, which is non-refundable even if omecamtiv mecarbil is never commercialized. Concurrently, we entered into a common stock purchase agreement with RPFT through which RPFT purchased 875,656 shares of the Company's common stock for $10.0 million. We allocated the consideration and issuance costs on a relative fair value basis to our liability to RPFT related to sale of future royalties under the RP OM RPA (the "RP OM Liability") and the common stock sold to RPFT, which resulted in the RP OM Liability being initially recognized at $92.3 million. The RP OM RPA provides for the sale of a royalty to RPFT of 4.5% on worldwide net sales of omecamtiv mecarbil, subject to a potential increase of up to an additional 1% under certain circumstances. As a result of our receipt of a CRL on February 28, 2023 in connection to our NDA for omecamtiv mecarbil, pursuant to the terms of the RP OM RPA, the applicable royalty rate will increase to a maximum of 5.5% if omecamtiv approval obtains FDA approval at any time after June 30, 2023.

As a result of the termination of the Amgen Agreement and pursuant to our obligations under the RP OM RPA, we and RPFT amended the RP OM RPA on January 7, 2022 to preserve RPFT's rights under the RP OM RPA by providing for direct payments by us to RPFT of up to 5.5% of our and our affiliates and licensees worldwide net sales of omecamtiv mecarbil. The RP OM RPA, as amended, had no impact on the original accounting for the $92.3 million associated with the RP OM Liability established in February 2017.

We account for the RP OM Liability as a liability primarily because we have significant continuing involvement in generating the related revenue stream from which the liability will be repaid. If and when omecamtiv mecarbil is commercialized and royalties become due, we will recognize the portion of royalties paid to RPFT as a decrease to the RP OM Liability and a corresponding reduction in cash.

The carrying amount of the RP OM Liability is based on our estimate of the future royalties to be paid to RPFT over the life of the arrangement as discounted using an imputed rate of interest. The excess of future estimated royalty payments over the $92.3 million of allocated proceeds, less issuance costs, is recognized as non-cash interest expense using the effective interest method. The imputed rate of interest on the unamortized portion of the RP OM Liability was approximately 8.5% as of December 31, 2022 and 10.0% as of December 31, 2021.

During the third and fourth quarter of 2022, we updated our analyses of the RP OM RPA to reflect our current assumptions resulting from ongoing global market research and to reflect other adjustments in connection with our anticipated commercialization, including the result of FDA Cardiovascular and Renal Drugs Advisory Committee in December 2022 that voted the benefits of omecamtiv mecarbil do not outweigh its risks for the treatment of HFrEF. Our estimates regarding the amount of future royalty payments under the RP OM RPA decreased year over year, however the royalty rate and probability of success increased from 2021 to 2022. The adjustments are accounted for on a prospective basis in our liability calculation and resulted in changes in our imputed interest rate and non-cash interest expense from 10.0% and $12.9 million in 2021 to 8.5% and $16.2 million in 2022, respectively. In 2022, the change in estimate had no impact on revenue and reduced the net loss by $1.8 million. The change in accounting estimate reduced the net loss per share by $0.02 in 2022.

As a result of our receipt of a CRL in connection to our NDA for omecamtiv mecarbil (see Note 11), our estimates regarding the amount of future royalty payments under the RP OM RPA will be re-evaluated in the first quarter of 2023 and will be accounted for on a prospective basis in our liability calculation. As a consequence of our receipt of the CRL from FDA, any approval of omecamtiv mecarbil in the United States would likely only occur after June 30, 2023, the date at which the royalty rate under the RP OM RPA will increase to no more than 5.5%, while and the resulting sales forecast for omecamtiv mecarbil is expected to decrease since comercializaation and sales of omecamtiv mecarbil will be delayed.

Accounting for the Royalty Pharma Royalty Purchase Agreements

We periodically assess the amount and timing of expected royalty payments using a combination of internal projections and forecasts from external sources. To the extent such payments are greater or less than our initial estimates or the timing of such payments is materially different than its original estimates, we will prospectively adjust the amortization of the RP OM Liability and the RP Aficamten Liability and the effective interest rate.

There are a number of factors that could materially affect the amount and timing of royalty payments, a number of which are not within our control. The RP OM Liability and the RP Aficamten Liability are recognized using significant unobservable inputs. These inputs are derived using internal management estimates developed based on third party data, including competitor sales data, and reflect management's judgements, current market conditions surrounding competing products, and forecasts. The significant unobservable inputs include the estimated patient population, estimated selling price, estimated peak sales and sales ramp, the expected term of the royalty stream, timing of the expected launch and its impact on the royalty rate as well as the overall probability of success. A significant change in unobservable inputs could result in a material increase or decrease to the effective interest rate of the RP OM Liability and the RP Aficamten Liability.

We review our assumptions on a regular basis and our estimates may change in the future as we refine and reassess our assumptions.

Changes to the RP Aficamten Liability and the RP OM Liability are as follows (in thousands):

	2022		2021
	RP Aficamten Liability	RP OM Liability	RP OM Liability
Beginning balance, January 1	$ —	$ 179,072	$ 166,068
Initial carrying value	89,571	—	—
Interest accretion	15,546	16,196	12,892
Amortization of issuance costs	—	116	112
Ending balance, December 31	$ 105,117	$ 195,384	$ 179,072

As of December 31, 2022, the fair value of the liabilities related to the sale of future royalties to RPFT and RPI ICAV are consistent with their carrying values of $105.1 million and $195.4 million, respectively, and is based on our estimates of the amount and timing of future royalties expected to be paid to RPFT and RPI ICAV under the RP OM RPA and the RP Aficamten RPA agreements, respectively, as defined above, over the life of the arrangement, which are considered Level 3 inputs.

We recognized $31.7 million, $12.9 million, and $22.7 million in non-cash interest expense in 2022, 2021, and 2020, respectively, related to the RP Aficamten RPA and the RP OM RPA.

Note 7 — Debt

Silicon Valley Bank and Oxford Finance Term Loans

Prior to January 7, 2022, we maintained the Term Loan Agreement with Silicon Valley Bank and Oxford Finance LLC.

Both borrowings under the Term Loan Agreement were subject to interest at an annual rate equal to the greater of (a) 8.05% or (b) the sum of 6.81% plus the 30-day U.S. LIBOR rate. The borrowing under the Term Loan Agreement was repayable in monthly interest-only payments through December 31, 2020. The interest-only period was automatically extended until July 1, 2021 as a result of the Company's initiation of a Phase 2 trial for aficamten in oHCM and was extended through December 31, 2021 as a result of the achievement of positive results in GALACTIC-HF, the trial of omecamtiv mecarbil in chronic heart failure as announced on October 8, 2020. The ultimate interest-only period was to be followed by equal monthly payments of principal and interest to the maturity date in December 2023. We were required to make a final payment upon loan maturity of 6.00% of the notes payable, which we accreted over the life of the Term Loan Agreement. Our obligations under the Term Loan Agreement were secured by substantially all our current and future assets, other than our intellectual property.

The Term Loan Agreement was terminated, and all amounts thereunder repaid in connection to our entry into that certain RP Loan Agreement, between us and RPDF, as further described below. Amounts outstanding under the Term Loan Agreement were classified as non-current in our consolidated balance sheet as of December 31, 2021, because short-term obligations expected to be refinanced on a long-term basis are not expected to require the use of working capital during the ensuing fiscal year.

As a result of the termination of the Term Loan Agreement and the repayment to the Lenders, in 2022, we recorded $2.7 million in loss on debt extinguishment in the consolidated statements of operations and comprehensive loss, consisting of the premium on debt repayments and the write-off of the remaining term loan fees and debt issuance costs.

Interest expense for the Term Loan Agreement was immaterial for 2022 because it represented approximately one week of interest before extinguishment. Interest expense for the Term Loan Agreement was $4.8 million and $4.9 million for 2021 and 2020 respectively.

Convertible Notes

On November 13, 2019, the Company issued $138.0 million aggregate principal amount of 2026 Notes. On July 6, 2022, the Company issued $540.0 million aggregate principal amount of 2027 Notes and used approximately $140.3 million of the net proceeds from the offering of 2027 Notes and issued 8,071,343 shares of common stock to repurchase approximately $116.9 million aggregate principal amount of the 2026 Notes pursuant to privately negotiated exchange agreements entered into with certain holders of the 2026 Notes concurrently with the pricing of the offering of the 2027 Notes. As a result of the partial repurchase of the 2026 Notes, the Company recorded an inducement loss of $22.2 million, consisting of the difference between the consideration to the holders pursuant to the exchange agreements and the if-converted value of the 2026 Notes under the original terms. As of December 31, 2022, there remain $21.1 million aggregate principal amount of 2026 Notes outstanding.

The 2026 Notes are unsecured obligations and bear interest at an annual rate of 4.0% per year, payable semi-annually on May 15 and December 15 of each year, beginning May 15, 2020. The 2026 Notes are governed by an indenture between the Company and U.S. Bank National Association, as trustee. The 2026 Notes will mature on November 15, 2026, unless earlier repurchased or redeemed by the Company or converted at the option of the holders. The Company may redeem the 2026 Notes prior to the maturity date but is not required to and no sinking fund is provided for the 2026 Notes. The 2026 Notes may be converted, under certain circumstances as described below, based on an initial conversion rate of 94.7811 shares of common stock per $1,000 principal amount (which represents an initial conversion price of $10.55 per share). The conversion rate for the 2026 Notes will be subject to adjustment upon the occurrence of certain specified events. In addition, upon the occurrence of a make-whole fundamental change (as defined in the indenture), the Company will, in certain circumstances, increase the conversion rate by a number of additional shares for a holder that elects to convert its notes in connection with such make-whole fundamental change. The Company received approximately $133.9 million in net proceeds, after deducting the initial purchasers' discount, from the issuance of the 2026 Notes.

The 2026 Notes may be converted at the option of the holder under any of the following circumstances: (1) during any calendar quarter commencing after the calendar quarter ending on March 31, 2020 (and only during such calendar quarter), if the last reported sale price of the Company's common stock for at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days ending on, and including, the last trading day of the immediately preceding calendar quarter exceeds 127.5% of the last reported sale price of the Company's common stock on November 7, 2019; (2) during the 5 consecutive business days immediately after any 10 consecutive trading day period (such 10 consecutive trading day period, the "measurement period") if the trading price per $1,000 principal amount of 2026 Notes for each trading day of the measurement period was less than 98% of the product of the last reported sale price per share of the Company's common stock on such trading day and the conversion rate on such trading day; (3) upon the occurrence of certain corporate events or distributions on the Company's common stock; (4) if the Company calls the 2026 Notes for redemption; and (5) at any time from, and including, July 15, 2026 until the close of business on the scheduled trading day immediately before the maturity date, November 15, 2026. The Company will settle conversions by paying or delivering, as applicable, cash, shares of the Company's common stock, or a combination of cash and shares of the Company's common stock, at the Company's election, based on the applicable conversion rate. The 2026 Notes are convertible at December 31, 2022 based on circumstance (1) defined above.

The 2026 Notes will be redeemable, in whole or in part, at the Company's option at any time, and from time to time, on or after November 20, 2023 and, in the case of any partial redemption, on or before the 60th scheduled trading day before the maturity date, at a cash redemption price equal to the principal amount of the 2026 Notes to be redeemed, plus accrued and unpaid interest, if any, to, but excluding, the redemption date but only if the last reported sale price per share of the Company's common stock exceeds 130% of the conversion price on (1) each of at least 20 trading days, whether or not consecutive, during the 30 consecutive trading days ending on, and including, the trading day immediately before the date the Company sends the related redemption notice; and (2) the trading day immediately before the date the Company sends such notice. If a "fundamental change" (as defined in the indenture agreement, dated November 13, 2019 between the Company and U.S. Bank National Association, as trustee, as supplemented by the first supplemental indenture dated as of November 13, 2019 between the Company and such trustee) occurs, then, subject to certain exceptions, holders may require the Company to repurchase their 2026 Notes at a cash repurchase price equal to the principal amount of the 2026 Notes to be repurchased, plus accrued and unpaid interest, if any, to, but excluding, the fundamental change repurchase date.

As discussed in Note 1, effective January 1, 2022, the Company adopted ASU 2020-06 using the modified retrospective method and, as a result, it is no longer required to separately account for the liability and equity components of the 2026 Notes, and, instead, account for the 2026 Notes wholly as debt.

The following table presents the total amount of interest cost recognized relating to the 2026 Notes (in thousands):

	Years Ended December 31,		
	2022	2021	2020
Contractual interest expense	$ 3,265	$ 5,520	$ 5,520
Accretion of debt discount	—	5,907	5,246
Accretion of debt issuance costs	355	59	52
Total interest costs recognized	$ 3,620	$ 11,486	$ 10,818

The effective interest rate of the 2026 Notes was 4.6% for the year ended December 31, 2022. As of December 31, 2022, the unamortized debt issuance cost for the 2026 Notes was $0.5 million and will be amortized over approximately 3.9 years. If the 2026 Notes were to be converted on December 31, 2022, the holders of the 2026 Notes would receive common shares of 2.6 million with an aggregate value of $117.0 million based on the Company's closing stock price of $45.82 as of December 31, 2022. The if-converted value of the 2026 Notes exceeded its principal amount by $95.9 million as of December 31, 2022.

The 2027 Notes are the Company's senior, unsecured obligations and are (i) senior in right of payment to the Company's future indebtedness that is expressly subordinated to the 2027 Notes in right of payment; (ii) equal in right of payment with all of the Company's indebtedness that is not so subordinated (including the 2026 Notes); (iii) effectively subordinated to the Company's existing and future secured indebtedness, to the extent of the value of the collateral securing that indebtedness; and (iv) structurally subordinated to all existing and future indebtedness and other liabilities, including trade payables, and (to the extent the Company is not a holder thereof) preferred equity, if any, of the Company's subsidiaries. The net proceeds of the 2027 Notes were approximately $523.6 million after deducting issuance costs related to the 2027 Notes. The 2027 Notes bear interest at a rate of 3.50% per year, payable semiannually in arrears on January 1 and July 1 of each year, beginning on January 1, 2023. The 2027 Notes will mature on July 1, 2027, unless earlier converted, redeemed or repurchased.

The 2027 Notes are convertible into cash, shares of the Company's common stock or a combination of cash and shares of the Company's common stock, at the Company's election, based on the applicable conversion rate(s). The initial conversion rate for the 2027 Notes is 19.5783 shares of the Company's Common Stock per $1,000 principal amount of such Notes, which is equivalent to an initial conversion price of approximately $51.08 per share. Holders of the 2027 Notes may convert all or any portion of their convertible notes at their option only in the following circumstances: (i) during any calendar quarter (and only during such calendar quarter) commencing after the calendar quarter ending on September 30, 2022, if the last reported sale price per share of the Company's common stock, $0.001 par value per share, exceeds 130% of the conversion price for each of at least 20 trading days, whether or not consecutive, during the 30 consecutive trading days ending on, and including, the last trading day of the immediately preceding calendar quarter; (ii) during the five consecutive business days immediately after any 10 consecutive trading day period (such 10 consecutive trading day period, the "measurement period") if the trading price per $1,000 principal amount of 2027 Notes for each trading day of the measurement period was less than 98% of the product of the last reported sale price per share of the Company's common stock on such trading day and the conversion rate on such trading day; (iii) upon the occurrence of certain corporate events or distributions on the Company's common stock, as described in the 2027 Indenture; (iv) if the Company calls such 2027 Notes for redemption; and (v) at any time from, and including, March 1, 2027 until the close of business on the scheduled trading day immediately before the maturity date.

The Company may not redeem the 2027 Notes at its option at any time before July 7, 2025. The 2027 Notes will be redeemable, in whole or in part (subject to the "Partial Redemption Limitation" (as defined in the 2027 Indenture)), at the Company's option at any time, and from time to time, on or after July 7, 2025 and, in the case of a partial redemption, on or before the 60th scheduled trading day immediately before the maturity date, at a cash redemption price equal to the principal amount of the 2027 Notes to be redeemed, plus accrued and unpaid interest, if any, to, but excluding, the redemption date, but only if the last reported sale price per share of the Company's common stock exceeds 130% of the conversion price on (i) each of at least 20 trading days, whether or not consecutive, during the 30 consecutive trading days ending on, and including, the trading day immediately before the date the Company sends the related redemption notice; and (ii) the trading day immediately before the date the Company sends such notice. In addition, calling any of the 2027 Notes for redemption will constitute a Make-Whole Fundamental Change with respect to that convertible note, in which case the conversion rate applicable to the conversion of that Note will be increased in certain circumstances if it is converted after it is called for redemption. The conversion rate for the 2027 Notes shall not exceed 25.4517 shares per $1,000 principal amount of such Notes, subject to certain customary anti-dilution adjustments (as defined in the 2027 indenture). Pursuant to the Partial Redemption Limitation, the Company may not elect to redeem less than all of the outstanding 2027 Notes unless at least $75.0 million aggregate principal amount of 2027 Notes are outstanding and not subject to redemption as of the time the Company sends the related redemption notice.

If a "Fundamental Change" (as defined in the 2027 Indenture) occurs, then, subject to a limited exception for certain cash mergers, noteholders may require the Company to repurchase their 2027 Notes at a cash repurchase price equal to the principal amount of the 2027 Notes to be repurchased, plus accrued and unpaid interest, if any, to, but excluding, the fundamental change repurchase date. The definition of Fundamental Change includes certain business combination transactions involving the Company and certain de-listing events with respect to the Company's common stock.

In accounting for the Notes, issuance costs of $16.4 million for the 2027 Notes were deducted from the respective debt liability in the consolidated balance sheet. Issuance costs are amortized to interest expense using the straight-line method, which materially approximates the effective interest method, over five-year term for the 2027 Notes.

The following table presents the total amount of interest cost recognized relating to the 2027 Notes (in thousands):

	2022
Contractual interest expense	$ 9,188
Amortization of debt issuance costs	1,542
Total interest expense recognized	$ 10,730

The effective interest rate of the 2027 Notes was 4.17% in 2022. As of December 31, 2022, the unamortized debt issuance cost for the 2027 Notes was $14.9 million and will be amortized over approximately 4.6 years. If the 2027 Notes were to be converted on December 31, 2022, the holders of the 2027 Notes would receive common shares of 10.5 million with an aggregate value of $484.4 million based on the Company's closing stock price of $45.82 as of December 31, 2022. The if-converted value of the 2027 Notes was below the principal value of the Notes of $540.0 million as of December 31, 2022. In addition, in 2022, the conditions allowing holders of the Notes to convert were not met. As a result, the Notes were not convertible at December 31, 2022 nor at any point during 2022.

Future minimum payments under the 2027 Notes and 2026 Notes are (in thousands):

Years ending December 31:	2027 Notes	2026 Notes	Total
2023	$ 9,450	$ 845	$ 10,295
2024	18,900	845	19,745
2025	18,900	845	19,745
2026	18,900	21,978	40,878
2027	558,900	—	558,900
Future minimum payments	625,050	24,513	649,563
Less: Interest	(85,050)	(3,381)	(88,431)
Convertible notes, principal amount	540,000	21,132	561,132
Less: Debt costs on the convertible notes	(14,871)	(453)	(15,324)
Net carrying amount of the convertible notes	$ 525,129	$ 20,679	$ 545,808

As of December 31, 2022, the estimated fair value of the 2027 Notes and 2026 Notes was $620.3 million and $94.8 million, respectively, and was based upon observable, Level 2 inputs, including pricing information from recent trades of the convertible notes.

Capped Call Transactions

In connection with the offering of the 2026 Notes, the Company entered into privately-negotiated capped call transactions with one of the underwriters in the offering or its affiliate. The Company used approximately $13.4 million of the net proceeds from the offering of the 2026 Notes to pay the cost of the capped call transactions. The capped call transactions were expected generally to reduce potential dilution to the Company's common stock upon any conversion of the 2026 Notes and/or offset any cash payments the Company would have been required to make in excess of the principal amount of converted 2026 Notes, as the case may be, in the event that the market value per share of the Company's common stock, as measured under the terms of the capped call transactions at the time of exercise, is greater than the strike price of the capped call transactions (which initially corresponds to the initial conversion price of the 2026 Notes, and is subject to certain adjustments), with such reduction and/or offset subject to a cap initially equal to approximately $14.07 per share (which represents a premium of approximately 70% over the last reported sale price of the Company's common stock on November 7, 2019), subject to certain adjustments. The capped call transactions were separate transactions, entered into by the Company and were not part of the terms of the 2026 Notes.

Given that the transactions meet certain accounting criteria, the convertible note capped call transactions were recorded in stockholders' equity, they were not accounted for as derivatives and were not remeasured each reporting period.

On October 24, 2022, we entered into a termination agreement in connection to the capped call transactions and thereby released the capped call counterparties of any further obligations in relation to the capped call transactions. As a result of the termination agreement and unwinding of the capped call transactions, we received gross proceeds of $26.4 million in cash.

Note 8 — Stockholders' Equity

Equity Incentive Plan

Our 2004 Plan provides for us to grant incentive stock options, nonstatutory stock options, restricted stock, stock appreciation rights, restricted stock units, performance shares and performance units to employees, directors, and consultants. We may grant options for terms of up to ten years at prices not lower than 100% of the fair market value of our common stock on the date of grant. Options granted to new employees generally vest 25% after one year and monthly thereafter over a period of four years. Options granted to existing employees generally vest monthly over a period of four years.

In May 2022, our stockholders approved an amendment to the 2004 Plan to increase the number of authorized shares reserved for issuance under the 2004 Plan by an additional 6.0 million shares. In May 2022, our board of directors approved an amendment to the 2004 Plan to increase the number of authorized shares reserved for issuance under the 2004 Plan by an additional 1.6 million shares for inducement grants to new employees. As of December 31, 2022, the total authorized shares under the 2004 Plan available for grant was 9.7 million.

Stock option activity in 2022, 2021, and 2020 was as follows:

	Stock Options Outstanding	Weighted Average Exercise Price per Share	Weighted Average Remaining Contractual Life (in years)	Aggregate Intrinsic Value (in millions)
Balance at December 31, 2019	7,759,012	$ 8.59		
Granted	1,944,562	15.59		
Exercised	(967,571)	8.27		
Forfeited	(234,054)	16.06		
Balance at December 31, 2020	8,501,949	$ 10.02		
Granted	2,513,350	22.43		
Exercised	(1,346,194)	9.01		
Forfeited	(296,146)	14.56		
Balance at December 31, 2021	9,372,959	$ 13.35		
Granted	3,424,150	39.79		
Exercised	(1,389,031)	10.13		
Forfeited	(415,675)	28.94		
Balance at December 31, 2022	10,992,403	$ 22.13	7.0	$ 261.9
Exercisable at December 31, 2022	6,153,725	$ 13.21	5.6	$ 200.7

We have elected to account for forfeitures as they occur. The intrinsic value of stock options exercised, calculated based on the difference between the market value at the date of exercise and the exercise price, was $46.3 million for 2022, $29.3 million for 2021, and $14.0 million for 2020. The intrinsic value of stock options outstanding at December 31, 2022 was $261.9 million.

RSU, including PSU, activity in 2022, 2021, and 2020 was as follows:

	Number of Restricted Stock Units	Weighted Average Award Date Fair Value per Share
Balance at December 31, 2019	839,075	$ 7.49
Granted	731,225	14.40
Exercised	(435,450)	7.72
Forfeited	(18,208)	10.37
Balance at December 31, 2020	1,116,642	$ 11.88
Granted	1,093,450	21.69
Exercised	(606,240)	11.13
Forfeited	(189,025)	21.32
Balance at December 31, 2021	1,414,827	$ 18.52
Granted	780,519	37.69
Exercised	(707,772)	16.72
Forfeited	(273,310)	26.65
Balance at December 31, 2022	1,214,264	$ 30.07

RSUs generally vest annually over two to three years. For 2022, the fair value of RSUs vested, calculated based on the units vested multiplied by the closing price of our common stock on the date of vesting, was $26.2 million.

Performance Stock Units

In May 2021, the Compensation Committee granted a total of 375,000 PSUs to certain employees with a weighted average grant date fair value of $25.32 per unit. The fair value of the PSUs was determined on the grant date based on the fair value of the Company's common stock at such time. The PSUs consist of two equal tranches with 50% of each tranche vesting upon achieving certain performance criteria and 50% vesting at the one-year anniversary of such achievement provided the recipient has been continuously employed by the Company. The first tranche vests upon certification by the Compensation Committee that the NDA for omecamtiv mecarbil has been filed and accepted by the FDA by December 31, 2021 or June 30, 2022 and the second tranche vests upon certification by the Compensation Committee that the FDA approval of the NDA is with an approved label that is consistent with the expectations underlying the Company's commercial launch plans for omecamtiv mecarbil in effect immediately prior to such approval by June 30, 2022 or December 31, 2022.

In 2022, the performance target for the first tranche of PSUs was met. As a result, the Company recognized expense of $0.7 million in 2022 for the first tranche of PSUs. No expense has been recognized for the second tranche to date. The performance target for the second tranche of PSUs has not been met, and therefore, such second tranche of PSUs consisting of 182,500 PSUs are deemed forfeited. As of December 31, 2022, there was $0.1 million of unamortized stock-based compensation related to the first tranche.

Employee Stock Purchase Plan

Under our ESPP, employees may purchase common stock up to a specified maximum amount at a price equal to 85% of the fair market value at certain plan-defined dates. In May 2020, the Company's stockholders approved an amendment to the ESPP to increase the number of common stock shares reserved for issuance under the ESPP by 0.5 million shares.

We issued 98,153 shares at an average price of $32.89 per share during 2022, 108,780 shares at an average price of $16.33 per share in 2021, and 134,684 shares at an average price of $11.21 per share in 2020 pursuant to the ESPP. At December 31, 2022, we have 239,887 shares of common stock reserved for issuance under the ESPP.

Stock-Based Compensation Expense

We use the Black-Scholes option pricing model to determine the fair value of stock option grants to employees and directors and employee stock purchase plan shares. The fair value of share-based payments was estimated on the date of grant based on the following assumptions:

	Year Ended December 31, 2022		Year Ended December 31, 2021		Year Ended December 31, 2020	
	Options	ESPP	Options	ESPP	Options	ESPP
Risk-free interest rate	1.41% to 4.01%	1.63% to 4.65%	0.58% to 1.28%	0.05%	0.42% to 1.8%	0.11% to 1.8%
Volatility	66% to 67%	64% to 65%	66% to 67%	66% to 67%	74% to 75%	74% to 75%
Expected term in years	6.3 to 6.4	0.5	6.4 to 6.5	0.5	6.5 to 6.6	0.5
Expected dividend yield	0%	0%	0%	0%	0%	0%

We use U.S. Treasury zero-coupon issues with remaining terms similar to the expected terms of the options for the risk-free interest rate. We use our own volatility history based on its stock's trading history and our own historical exercise and forfeiture activity to estimate expected term for option grants. We do not anticipate paying dividends in the foreseeable future and use an expected dividend yield of zero. We do not estimate forfeitures in our stock-based compensation.

We measure compensation expense for restricted stock units at fair value on the date of grant and recognize the expense over the expected vesting period. We recognize stock-based compensation expense on a ratable basis over the requisite service period, generally the vesting period of the award for share-based awards.

Stock-based compensation expense for 2022, 2021, and 2020 was as follows (in thousands):

	Years Ended December 31,		
	2022	2021	2020
Research and development	$ 19,100	$ 10,463	$ 6,949
General and administrative	28,753	16,369	10,671
	$ 47,853	$ 26,832	$ 17,620

Stock-based compensation expense for share-based awards to non-employees was $0.1 million in 2022, and $0.2 million in 2021, and 2020.

As of December 31, 2022, we expect to recognize $94.4 million of unrecognized compensation cost related to unvested stock options over a weighted-average period of 2.8 years, $20.5 million of unrecognized compensation cost related to unvested restricted stock over a weighted-average period of 1.5 years, and $0.1 million of unrecognized compensation cost related to the first tranche of PSUs.

Warrants

In May 2022, Silicon Valley Bank exercised 16,901 warrants issued pursuant to the Term Loan Agreement with a strike price of $7.10 per share and elected the cashless settlement method. In June 2022, Silicon Valley Bank exercised additional 9,226 warrants and 8,638 warrants with a strike price of $9.76 per share and $10.42 per share, respectively. Accordingly, in 2022, we issued to Silicon Valley Bank a total of 28,306 shares of our common stock.

As of December 31, 2022, we had the following outstanding warrants issued pursuant to the Term Loan Agreement with a weighted average exercise price of $10.42 per share to purchase 12,957 shares of our common stock:

Issuance Date	Expiration Date	Exercise Price	Warrants Exercised during the Year Ended December 31, 2022	Warrants Outstanding at December 31, 2022
January 2020	January 2030	$ 10.42	8,638	12,957
May 2019	May 2029	9.76	9,226	—
August 2018	August 2028	7.10	16,901	—
			34,765	12,957

As of December 31, 2021 and 2020, we had the following outstanding warrants issued pursuant to the Term Loan Agreement with a weighted average exercise price of $9.12 per share to purchase 47,722 shares of our common stock: o

Issuance Date	Expiration Date	Exercise Price	Warrants Outstanding at December 31, 2019	Warrants Exercised during the Year Ended December 31, 2020	Warrants Outstanding at December 31, 2020 and 2021
January 2020	January 2030	$ 10.42	—	—	21,595
May 2019	May 2029	9.76	23,065	13,839	9,226
August 2018	August 2028	7.10	42,253	25,352	16,901
February 2016	February 2026	6.59	51,214	51,214	—
October 2015	October 2025	6.90	48,892	48,892	—
			165,424	139,297	47,722

Claims Settlement

In the first quarter of 2020, we received $2.2 million from a claims settlement with certain institutional investors that were beneficial owners of our common stock related to the disgorgement of short swing profits pursuant to Section 16(b) of the Securities Exchange Act of 1934, as amended. This settlement was recognized in equity as additional paid-in capital.

Note 9 — Commitments and Contingencies

Operating Leases

In May 2021, we amended the lease agreement for buildings 250, 256 and 280 East Grand Avenue, South San Francisco, California for our existing facilities and extended the lease term until June 30, 2022, which was accounted for as a lease modification in accordance with ASC 842, *Leases*. Pursuant to such guidance, the Company remeasured the modified lease using the revised term as of the modification date. Adjustments were made to reflect the remeasured liability with the offset to the right-of-use asset. The lease includes rental payments and payment of certain operating expenses.

During the fourth quarter of 2021, we officially relocated from our old headquarters to our new facilities at Oyster Point. As a result of the relocation, we considered ceasing use of the existing headquarters, which triggered an impairment assessment. In connection with this assessment, we recorded an impairment loss of $2.8 million, consisting of right-of-use assets of the existing headquarters, which is included in operating expenses on the consolidated statement of operations for the year ended December 31, 2021. No expense was recognized in 2022 due to the impairment that was recorded in 2021. We were subject to the fixed rental fee payments for the existing headquarters until the lease expired in June 2022.

In July 2019, we entered into the Oyster Point Lease of office and laboratory space at a facility located in South San Francisco, California and in May 2020, January 2021, November 2021, and October 2022, we entered into first, second, third, and fourth amendments to the Oyster Point Lease.

The Oyster Point Lease commenced on March 31, 2021 and upon commencement, we recognized a right-of-use asset of $77.9 million, a short-term lease liability of $3.7 million and a long-term lease liability of $85.3 million. The long-term lease liability includes $11.1 million of tenant improvement reimbursements as of March 31, 2021. The Oyster Point Lease has expiration date of October 31, 2033 and we have two consecutive five-year options to extend the lease. The options to extend the lease term were not included as part of the right-of-use asset or lease liability as the exercise of the options were not reasonably assured at the inception of the lease. During the fourth quarter of 2022, we entered into the fourth amendment of the lease to amend the lease payment schedule, which increased the remaining lease payment through the lease expiration date. The amendments were accounted for as lease modifications in accordance with ASC 842.

As of December 31, 2022, the remaining lease term of the Oyster Point Lease is 10.8 years and the discount rate used to determine the related lease liability was 8.7%. We paid a total security deposit of $5.1 million in December 2019 and December 2020. The landlord has provided a tenant improvement allowance of $43.6 million in aggregate for costs relating to the initial design and construction of the improvements. As of December 31, 2022, the total commitment of undiscounted lease payments for the Oyster Point Lease was $220.4 million.

In January 2022, we entered into a series of lease agreements with the sub-landlord and landlord and leased an office space at a facility located in Radnor, Pennsylvania (the "Radnor Lease"). The Radnor Lease commenced on September 1, 2022, when the leasehold improvements were substantially completed, and we gained a control over the use of the underlying assets. Upon commencement, we recognized a right-of-use asset of $3.4 million, a short-term lease liability of $0.4 million and a long-term lease liability of $1.9 million. The right-of-use asset includes $1.1 million of lease prepayments made before the commencement date. We will pay certain operating costs of the facility and have certain rights to sublease under the agreement. The Radnor Lease had an initial expiration date of May 31, 2024 with the sub-landlord. We will then continue to lease the premises with the landlord through July 31, 2027 with one five-year option to extend the lease. The option to extend the lease term were not included as part of the right-of-use asset or lease liability as the exercise of the options were not reasonably assured at the inception of the lease.

As of December 31, 2022, the remaining lease term of the Radnor Lease is 4.6 years and the discount rate used to determine the related lease liability was 8.3%. We have incurred a tenant improvement cost of $1.2 million relating to the initial design and construction of the improvements before the commencement date. The tenant improvement cost is offset by a tenant improvement allowance of $0.3 million from the landlord, and the net tenant improvement cost incurred before the commencement date is accounted for lease prepayment. The total commitment of undiscounted lease payments for the Radnor Lease was $2.8 million as of December 31, 2022.

Cash paid for operating lease for the years ended December 31, 2022 and 2021 was $24.1 million and $6.1 million, respectively, and was included in net cash used in operating activities in our consolidated statements of cash flows.

Finance Leases

During the third quarter of 2021, we entered into a master lease agreement for laboratory equipment leases that commenced in the fourth quarter of 2021. The leases have an initial term of 3 years, commenced through the second quarter of 2022 and expire in 2025. The master lease agreement provides a purchase option with a bargain purchase price, which we expect to exercise at the end of the term. The Company classified the leases as finance leases.

Finance leases are accounted for on the consolidated balance sheets with right-of-use assets and lease liabilities recognized in property and equipment, other current liabilities, and other non-current liabilities, respectively. The finance lease cost is recognized as a combination of the amortization expense for the right-of-use assets calculated on a straight-line basis over the five-year estimated useful life for laboratory equipment and interest expense for the outstanding lease liabilities using the determined discount rates. As of December 31, 2022, we have recognized finance lease right-of-use assets of $2.4 million, short-term finance lease liabilities of $1.0 million, and long-term finance lease liabilities of $1.0 million.

As of December 31, 2022, the weighted average remaining lease term for the finance leases is 4.0 years and the weighted average discount rate used to determine the finance lease liabilities is 9.47%.

The cash paid for finance lease for the year ended December 31, 2022 was $0.9 million and was included in financing activities in our consolidated statement of cash flows.

Future minimum lease payments under non-cancellable leases as of December 31, 2022 is as follows (in thousands):

Years ending December 31:	Operating Leases	Finance Leases
2023	$ 13,465	$ 990
2024	18,738	990
2025	19,563	204
2026	20,180	—
2027	20,514	—
Thereafter	130,719	—
Total future minimum lease payments	223,179	2,184
Less: Imputed interest	(83,455)	(183)
Total lease liability	$ 139,724	$ 2,001

Rent expense for operating and finance leases was $21.6 million, $23.1 million, and $5.7 million for 2022, 2021, and 2020, respectively.

Note 10 — Income Taxes

We did not record an income tax provision in 2022, 2021, and 2020 because we had net taxable losses. Our significant jurisdictions are the United States and California.

The following reconciles the statutory federal income tax rate to our effective tax rate:

	Years Ended December 31,		
	2022	2021	2020
Tax at federal statutory tax rate	21%	21%	21%
State tax, net of federal benefits	1%	0%	1%
Change in state effected rates	0%	(1)%	(2)%
Tax credits, net	4%	3%	3%
Change in valuation allowance	(26)%	(24)%	(23)%
Stock-based compensation	2%	2%	1%
Other	(2)%	(1)%	(1)%
Total	0%	0%	0%

Deferred tax assets, net, reflecting the net tax effect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes, were as follows (in thousands):

	As of December 31,	
	2022	2021
Deferred tax assets:		
Net operating loss carryforwards	$ 202,459	$ 181,977
Tax credits	98,292	77,366
Liability related to sale of future royalties	68,366	38,302
Reserves and accruals	23,950	15,409
Capitalized R&D	48,047	1,115
Long-term lease liability	28,901	26,223
Deferred revenue	—	18,608
Total noncurrent deferred tax assets	470,015	359,000
Deferred tax liabilities:		
Depreciation and amortization	(7,909)	(7,664)
Operating lease right-of-use assets	(18,192)	(15,643)
Convertible notes	—	(8,296)
Total noncurrent deferred tax liabilities	(26,101)	(31,603)
Less: Valuation allowance	(443,914)	(327,397)
Net deferred tax assets	$ —	$ —

Realization of deferred tax assets is dependent upon future earnings, if any, the timing and amount of which are uncertain. Based upon the weight of available evidence, which includes our historical operating performance, reported cumulative net losses since inception, expected future losses, and difficulty in accurately forecasting our future results and an assessment of both positive and negative evidence when determining whether it is more likely than not that deferred tax assets are recoverable, we maintained a full valuation allowance on the net deferred tax assets as of December 31, 2022 and 2021. The valuation allowance increased by $116.5 million in 2022 and increased by $52.6 million in 2021.

At December 31, 2022 federal NOL carryforwards were $834.4 million and apportioned state NOL carryforwards before federal benefits were $367.1 million. If not utilized, federal and state operating loss carryforwards incurred prior to 2018 will begin to expire in various amounts beginning 2022 and 2028, respectively.

At December 31, 2022, tax credits of $99.4 million and $21.0 million for federal and California income tax purposes, respectively consisted of Research and Development Credits and Orphan Drug Credits. If not utilized, the federal carryforwards will expire in various amounts beginning in 2022. California based credit carryforwards do not expire.

In general, under Section 382, a corporation that undergoes an ‘ownership change’ is subject to limitations on its ability to utilize its pre-change net operating losses and tax credits to offset future taxable income. We do not believe it has experienced an ownership change since 2006, however, a portion of its NOLs and tax credits prior to 2007 will be subject to limitations under Section 382.

Activity related to our gross unrecognized tax benefits were (in thousands):

	Years Ended December 31,		
	2022	2021	2020
Balance at the beginning of the year	$ 11,295	$ 10,522	$ 9,922
Increase related to prior year tax positions	4,438	—	—
Decrease related to prior year tax positions	(1,804)	(29)	(3)
Increase related to current year tax positions	4,426	802	603
Balance at the end of the year	$ 18,355	$ 11,295	$ 10,522

We are subject to federal and various state and local income tax examination for all fiscal years with unutilized NOLs and tax credit carryforwards. Included in the balance of unrecognized tax benefits as of December 31, 2022, 2021, and 2020 are $17.7 million, $10.3 million, and $9.6 million of tax benefits, respectively, that, if recognized, would result in adjustments to other tax accounts, primarily deferred taxes.

On March 27, 2020, the Coronavirus Aid, Relief, and Economic Security (CARES) Act was signed into law making several changes to the Internal Revenue Code, including provisions addressing the carryback of net operating losses for specific periods, refunds of alternative minimum tax credits, temporary modifications to limitations placed on the tax deductibility of net interest expenses, and technical amendments for qualified improvement property. Additionally, the CARES Act provides for refundable employee retention tax credits and the deferral of the employer-paid portion of Social Security taxes. For the years ended December 31, 2022, 2021, and 2020, respectively, the Company's income tax provision was not significantly impacted by the CARES Act.

The Inflation Reduction Act of 2022, or IRA, was signed into law on August 16, 2022. The bill was meant to address the high inflation rate in the United States through various climate, energy, healthcare, and other incentives. These incentives are meant to be paid for by the tax provisions included in the IRA, such as a new 15 percent corporate minimum tax, a 1 percent new excise tax on stock buybacks, additional IRS funding to improve taxpayer compliance, and others. The IRA provisions are effective for tax years beginning after December 31, 2022. At this time, none of the IRA tax provisions are expected to have a material impact to our consolidated tax provision for the year ending December 31, 2023. The Company will continue to closely monitor any effects from future legislation.

Note 11 — Subsequent Events

CRL in response to our NDA for omecamtiv mecarbil

On February 28, 2023, we announced that we received a CRL from the FDA's Division of Cardiology and Nephrology regarding our NDA for omecamtiv mecarbil for the treatment of HFrEF. According to the CRL, GALACTIC-HF is not sufficiently persuasive to establish substantial evidence of effectiveness for reducing the risk of heart failure events and cardiovascular death in adults with chronic heart failure with HFrEF, in lieu of evidence from at least two adequate and well-controlled clinical investigations. In addition, FDA stated that results from an additional clinical trial of omecamtiv mecarbil are required to establish substantial evidence of effectiveness for the treatment of HFrEF, with benefits that outweigh the risks. FDA's decision to issue a CRL follows an FDA Cardiovascular and Renal Drugs Advisory Committee's vote of 8 to 3 in December 2022 that the benefits of omecamtiv mecarbil do not outweigh its risks for the treatment of HFrEF.

Controlled Equity Offering℠ Sales Agreement with Cantor Fitzgerald & Co.

On March 1, 2023, we entered into an amended and restated Controlled Equity Offering℠ Sales Agreement (the "Amended ATM Facility"), with Cantor Fitzgerald & Co. ("Cantor"), under which we may offer and sell, from time to time at our sole discretion, shares of our common stock, par value $0.001 per share ("the Common Stock") having an aggregate offering price of up to $300.0 million through Cantor, as sales agent. The Amended ATM Facility amends, restates and supersedes the Controlled Equity Offering℠ Sales Agreement dated as of March 6, 2019 between the Company and Cantor.

Cantor may sell the Common Stock by any method that is deemed to be an "at the market offering" as defined in Rule 415 of the Securities Act of 1933, as amended, including sales made directly on the Nasdaq Global Select Market or any other trading market for our common stock. Cantor will use commercially reasonable efforts to sell the Common Stock from time to time, based upon instructions from us (including any price, time or size limits or other customary parameters or conditions we may impose). We will pay Cantor a commission of up to 3.0% of the aggregate gross sales proceeds of any common stock sold through Cantor under the Amended ATM Facility, and also have provided Cantor with customary indemnification rights.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

None.

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures:

We maintain disclosure controls and procedures that are designed to ensure that information required to be disclosed in our reports under the Securities Exchange Act of 1934, as amended, or the Exchange Act, is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and that such information is accumulated and communicated to our management, including our Chief Executive Officer, Chief Financial Officer and Chief Accounting Officer, as appropriate, to allow for timely decisions regarding required disclosure. In designing and evaluating the disclosure controls and procedures, we recognize that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and in reaching a reasonable level of assurance, we are required to apply our judgment in evaluating the cost-benefit relationship of possible controls and procedures.

As required by Rule 13a-15(b) under the Exchange Act, our management, under the supervision and with the participation of our principal executive officer and principal financial officer, has evaluated the effectiveness of the design and operation of our disclosure controls and procedures (as such term is defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) as of December 31, 2022. Based on such evaluation, our principal executive officer and principal financial officer have concluded that, as of December 31, 2022, our disclosure controls and procedures were effective at the reasonable assurance level.

Management's Annual Report on Internal Control Over Financial Reporting:

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rules 13a-15(f) and 15d-15(f). Under the supervision and with the participation of our management, including our Chief Executive Officer, Chief Financial Officer and Chief Accounting Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2022 based on the framework in Internal Control — Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 Framework) (the COSO criteria). Based on the above evaluation, our management concluded that our internal control over financial reporting was effective as of December 31, 2022.

Our independent registered public accounting firm, Ernst & Young LLP, has audited the financial statements included in this Annual Report and has issued a report on the effectiveness of our internal control over financial reporting. The report of Ernst & Young LLP is included below.

Changes in Internal Control over Financial Reporting

There were no other changes in our internal controls over financial reporting identified in connection with the evaluation required by Rules 13a-15(d) and 15d-15(d) of the Exchange Act that occurred during the fiscal quarter ended December 31, 2022 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors and Stockholders
Cytokinetics, Incorporated

Opinion on Internal Control Over Financial Reporting

We have audited Cytokinetics, Incorporated's internal control over financial reporting as of December 31, 2022, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). In our opinion, Cytokinetics, Incorporated (the "Company") maintained, in all material respects, effective internal control over financial reporting as of December 31, 2022, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the 2022 consolidated financial statements of the Company and our report dated March 1, 2023 expressed an unqualified opinion thereon.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Annual Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects.

Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

A company's internal control over financial reporting is a process designed 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. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Ernst & Young LLP

San Mateo, California
March 1, 2023

ITEM 9B. OTHER INFORMATION

On March 1, 2023, we entered into an amended and restated Controlled Equity Offering[SM] Sales Agreement (the "Amended ATM Facility"), with Cantor Fitzgerald & Co. ("Cantor"), under which we may offer and sell, from time to time at our sole discretion, shares of our common stock, par value $0.001 per share ("the Common Stock") having an aggregate offering price of up to $300.0 million through Cantor, as sales agent. The Amended ATM Facility amends, restates and supersedes the Controlled Equity Offering[SM] Sales Agreement dated as of March 6, 2019 between the Company and Cantor.

Cantor may sell the Common Stock by any method that is deemed to be an "at the market offering" as defined in Rule 415 of the Securities Act of 1933, as amended, including sales made directly on the Nasdaq Global Select Market or any other trading market for our common stock. Cantor will use commercially reasonable efforts to sell the Common Stock from time to time, based upon instructions from us (including any price, time or size limits or other customary parameters or conditions we may impose). We will pay Cantor a commission of up to 3.0% of the aggregate gross sales proceeds of any common stock sold through Cantor under the Amended ATM Facility, and also have provided Cantor with customary indemnification rights.

We are not obligated to make any sales of Common Stock under the Amended ATM Facility. The offering of shares of Common Stock pursuant to the Amended ATM Facility will terminate upon the termination of the Amended ATM Facility in accordance with its terms.

The foregoing description of the Amended ATM Facility is qualified in its entirety by reference to the Amended ATM Facility, a copy of which is attached hereto as Exhibit 10.28 to this Annual Report on Form 10-K and incorporated herein by reference.

The legal opinion of Cooley LLP relating to the shares of Common Stock being offered pursuant to the Amended ATM Facility is filed as Exhibit 5.1 to this Annual Report on Form 10-K.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information regarding our directors and executive officers, our director nominating process and our audit committee is incorporated by reference from our definitive Proxy Statement for our 2023 Annual Meeting of Stockholders, where it appears under the headings "Board of Directors," "Executive Officers," and, if applicable, "Delinquent Section 16(a) Reports."

Code of Ethics

We have adopted a Code of Ethics that applies to all our directors, officers and employees. We publicize the Code of Ethics through posting the policy on our website, www.cytokinetics.com. We will disclose on our website any waivers of, or amendments to, our Code of Ethics within four business days following the date of such amendment or waiver.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this item is incorporated by reference from our definitive Proxy Statement for our 2023 Annual Meeting of Stockholders, where it appears under the heading "Executive Compensation" and "Director Compensation."

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by this item is incorporated by reference from our definitive Proxy Statement for our 2023 Annual Meeting of Stockholders, where it appears under the headings "Security Ownership of Certain Beneficial Owners and Management" and "Executive Compensation – Equity Compensation Plans at December 31, 2022."

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required by this item is incorporated by reference from our definitive Proxy Statement for our 2023 Annual Meeting of Stockholders, where it appears under the headings "Certain Business Relationships and Related Party Transactions" and "Board of Directors – Independence of Directors."

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this item is incorporated by reference from our definitive Proxy Statement for our 2023 Annual Meeting of Stockholders, where it appears under the headings "Proposal Three – Ratification of Selection of Ernst & Young LLP as our Independent Registered Public Accounting Firm for the Fiscal Year Ending December 31, 2023.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

a) The following documents are filed as part of this Form 10-K:

(1) Financial Statements:

Our Consolidated Financial Statements are listed in the "Index to Consolidated Financial Statements" under Part II. Item 8 of this Annual Report on Form 10-K.

(2) Financial Statement Schedules:

Financial statement schedules have been omitted in this report because they are not applicable, not required under the instructions, or the information requested is set forth in the consolidated financial statements or related notes thereto.

b) Exhibits:

EXHIBIT INDEX

Exhibit No.	Exhibits	Incorporated by Reference				Filed Herewith
		Form	File No.	Filing Date	Exh. No.	
3.1	Amended and Restated Certificate of Incorporation.	S-3	333-174869	June 13, 2011	3.1	
3.2	Certificate of Amendment of Amended and Restated Certificate of Incorporation.	10-Q	000-50633	August 4, 2011	3.2	
3.3	Certificate of Amendment of Amended and Restated Certificate of Incorporation.	8-K	000-50633	June 25, 2013	5.1	
3.4	Certificate of Amendment of Amended and Restated Certificate of Incorporation	8-K	000-50633	May 20, 2016	3.1	
3.5	Amended and Restated Bylaws.	8-K	000-50633	February 17, 2023	3.1	
4.1	Specimen Common Stock Certificate.	10-Q	000-50633	May 9, 2007	4.1	
4.2	Form of Warrant Issuable to Oxford Finance LLC pursuant to that certain Loan and Security Agreement, dated as of May 17, 2019, by and among the Company, Oxford Finance LLC and Silicon Valley Bank.	10-Q	000-50633	August 9, 2019	4.2	
4.3	Base Indenture, dated November 13, 2019, between the Company and U.S. Bank National Association, as Trustee	8-K	000-50633	November 13, 2019	4.1	
4.4	First Supplemental Indenture, dated November 13, 2019, between the Company and U.S. Bank National Association, as Trustee (including the form of 4.00% Convertible Senior Note due 2026)	8-K	000-50633	November 13, 2019	4.2	
4.5	Indenture, dated July 6, 2022, between the Company and U.S. Bank Trust Company, National Association, as Trustee (including the form of 3.50% Convertible Senior Notes due 2027)	8-K	000-50633	July 6, 2022	4.1	
4.6	Description of Securities					X

4.7	Certificate of Designation	8-K	000-50633	April 18, 2011	4.5	
4.8	Certificate of Designation	8-K	000-50633	June 30, 2012	4.1	
4.9	Certificate of Change of Registered Agent					X
5.1	Opinion of Cooley LLP					X
10.1	Lease, dated July 24, 2019, by and between the Company and KR Oyster Point 1, LLC	10-Q	000-50633	November 1, 2019	10.52	
10.2	First Amendment to Lease, dated May 12, 2020, by and between the Company and KR Oyster Point 1, LLC	10-K	000-50633	February 26, 2021	10.59	
10.3	Second Amendment to Lease, dated January 26, 2021, by and between the Company and KR Oyster Point 1, LLC	10-K	000-50633	February 26, 2021	10.60	
10.4	Third Amendment to Lease, dated November 12, 2021, by and between the Company and KR Oyster Point 1, LLC	10-K	000-50633	February 25, 2022	10.4	
10.5	Fourth Amendment to Lease, dated October 12, 2022, by and between the Company and KR Oyster Point 1, LLC					X
10.6	Form of Indemnification Agreement between the Company and each of its directors and executive officers	10-Q	000-50633	August 5, 2008	10.1	
10.7+	Amended and Restated Executive Employment Agreement, dated May 21, 2007, by and between the Company and Robert Blum	10-Q	000-50633	August 5, 2008	10.69	
10.8+	Form of Amendment No. 1 to Amended and Restated Executive Employment Agreements	10-K	000-50633	March 12, 2009	10.68	
10.9+	Amended and Restated 2004 Equity Incentive Plan					X
10.10+	Amended and Restated 2015 Employee Stock Purchase Plan	DEF 14A	000-50633	March 26, 2020	Appendix A	
10.11+	Form of Option Agreement (Employee Annual Grant)					X
10.12+	Form of Option Agreement (New Hire Inducement)					X
10.13+	Form of Option Agreement (Director Annual Grant)					X
10.14+	Form of Option Agreement (Director Onboarding)					X
10.15+	Form of Restricted Stock Unit Award Agreement (Employee Annual Grant)					X
10.16+	Form of Restricted Stock Unit Award Agreement (Employee Key Performer)					X
10.17+	Form of Restricted Stock Unit Award Agreement (Director Annual Grant)					X

10.18+	Form of Executive Employment Agreement between the Company and its executive officers	10-K	000-50633	March 7, 2014	10.39	
10.19#†	License and Collaboration Agreement, dated July 14, 2020, by and between the Company and Ji Xing Pharmaceuticals Limited	10-Q/A	000-50633	March 11, 2021	10.1	
10.20#†	License and Collaboration Agreement, dated December 20, 2021, by and between the Company and Ji Xing Pharmaceuticals Limited	10-K	000-50633	February 25, 2022	10.14	
10.21#	Development Funding Loan Agreement, dated January 7, 2022, by and among Royalty Pharma Development Funding, LLC and the Company	10-K	000-50633	February 25, 2022	10.18	
10.22	First Amendment to Development Funding Loan Agreement, dated July 6, 2022, by and among Royalty Pharma Development Funding, LLC and the Company					X
10.23	Second Amendment to Development Funding Loan Agreement, dated December 8, 2022, by and among Royalty Pharma Development Funding, LLC and the Company					X
10.24#†	Royalty Purchase Agreement, dated February 1, 2017, by and between the Company and RPI Finance Trust	10-K	000-50633	March 6, 2017	10.44	
10.25#	Amendment No. 1 to Royalty Purchase Agreement, dated January 7, 2022, by and between the Company and RPI Finance Trust	10-K	000-50633	February 25, 2022	10.20	
10.26#	Revenue Participation Right Purchase Agreement, dated January 7, 2022, by and between the Company and Royalty Pharma Investments 2019 ICAV	10-K	000-50633	February 25, 2022	10.21	
10.27+	Description of Director Compensation	10-Q	000-50633	November 4, 2022	10.1	
10.28	Amended and Restated Controlled Equity Offering℠ Sales Agreement, dated as of March 1, 2023, by and between the Company and Cantor Fitzgerald & Co.					X
23.1	Consent of independent registered public accounting firm					X
24.1	Power of Attorney (included in the signature page to this report)					X
31.1	Certification of Principal Executive Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002					X

31.2	Certification of Principal Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002	X
31.3	Certification of Principal Accounting Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002	X
32.1	Certifications of the Principal Executive Officer, the Principal Financial Officer, and the Principal Accounting Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (18 U.S.C. Section 1350) (1)	X
101.INS	Inline XBRL Instance Document (the Instance Document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document)	X
101.SCH	Inline XBRL Taxonomy Extension Schema Document	X
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document	X
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document	X
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document	X
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document	X
104	Cover Page Interactive Data File (formatted as Inline XBRL in Exhibit 101)	X

Portions of this Exhibit have been omitted as being immaterial and would be competitively harmful if publicly disclosed or is of the type of information Cytokinetics treats as confidential.

† Schedules have been omitted pursuant to Item 601(a)(5) of Regulation S-K and will be furnished on a supplemental basis to the Securities and Exchange Commission upon request.

+ Management contract or compensatory plan.

(1) This certification accompanies the Form 10-K to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of the Registrant under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended (whether made before or after the date of the Form 10-K), irrespective of any general incorporation language contained in such filing.

(b) Exhibits

The exhibits listed under Item 15(a)(3) hereof are filed as part of this Form 10-K, other than Exhibit 32.1 which shall be deemed furnished.

(c) Financial Statement Schedules

None — All financial statement schedules are omitted because the information is inapplicable or presented in the notes to the financial statements.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities and Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

CYTOKINETICS, INCORPORATED

By: / S / ROBERT I. BLUM
Robert I. Blum
President, Chief Executive Officer and Director

Dated: March 1, 2023

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Robert I. Blum, Ching Jaw, and Robert Wong, and each of them, his true and lawful attorneys-in-fact, each with full power of substitution, for him in any and all capacities, to sign any amendments to this Annual Report on Form 10-K and to file the same, with exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, hereby ratifying and confirming all that each of said attorneys-in-fact or their substitute or substitutes may do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities and Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ ROBERT I. BLUM Robert I. Blum	President, Chief Executive Officer and Director (Principal Executive Officer)	March 1, 2023
/s/ CHING W. JAW Ching W. Jaw	Senior Vice President, Chief Financial Officer (Principal Financial Officer)	March 1, 2023
/s/ ROBERT C. WONG Robert C. Wong	Vice President, Chief Accounting Officer (Principal Accounting Officer)	March 1, 2023
/s/ JOHN T. HENDERSON John T. Henderson, M.B. Ch.B.	Chairman of the Board of Directors	March 1, 2023
/s/ MUNA BHANJI Muna Bhanji	Director	March 1, 2023
/s/ SANTO J. COSTA Santo J. Costa	Director	March 1, 2023
/s/ ROBERT A. HARRINGTON Robert A. Harrington, M.B.	Director	March 1, 2023
/s/ EDWARD M. KAYE Edward M. Kaye, M.D.	Director	March 1, 2023
/s/ B. LYNNE PARSHALL B. Lynne Parshall	Director	March 1, 2023
/s/ SANDFORD D. SMITH Sandford D. Smith	Director	March 1, 2023
/s/ WENDELL WIERENGA Wendell Wierenga, Ph.D.	Director	March 1, 2023
/s/ NANCY J. WYSENSKI Nancy J. Wysenski	Director	March 1, 2023

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CORPORATE PROFILE

EXECUTIVE MANAGEMENT

Robert I. Blum
President and Chief Executive Officer

Andrew Callos
EVP, Chief Commercial Officer

Daniel R. Casper
Vice President, Information Technology

Bonnie A. Charpentier, Ph.D.
Senior Vice President, Regulatory Affairs and Compliance

Steven M. Cook
Senior Vice President, Commercial Supply Chain Operations and Technical Operations

YulyMae DiNapoli
Vice President, Human Resources

Erin Donnelly
Vice President, Portfolio and Project Management

Genie Dubuk
Vice President, U.S. Marketing, *Omecamtiv Mecarbil*

John O. Faurescu, Esq.
Associate General Counsel

Steve B. Heitner, M.D.
Vice President, Clinical Research and Therapeutic Area Lead, Cardiovascular

Ching W. Jaw
Senior Vice President, Chief Financial Officer

John Jacoppi
Vice President, U.S. Marketing, *Aficamten*

Scott R. Jordan
Senior Vice President, New Product Planning and Commercial Development

Daniel E. Kates, M.D, M.B.A.
Vice President, Medical Affairs

Stuart Kupfer, M.D.
Senior Vice President, Chief Medical Officer

Kari K. Loeser, J.D.
Vice President, Chief Compliance Officer

Jeff Lotz
Vice President, Sales and Operations

Fady I. Malik, M.D., Ph.D., F.A.C.C.
Executive Vice President, Research and Development

Lisa Meng, Ph.D.
Vice President, Biometrics

Bradley P. Morgan, Ph.D.
Senior Vice President, Research and Non-Clinical Development

Anne M. Murphy, Ph.D.
Vice President, Biology

Diann Potestio
Vice President, Global Value, Access and Distribution

Stacy A. Rudnicki, M.D.
Vice President, Clinical Research and Therapeutic Area Lead, Neuromuscular

Elisabeth A. Schnieders, Ph.D.
Senior Vice President, Business Development

Eric Terhaerdt
Senior Vice President, Development Operations

Norma Tom, Ph.D.
Vice President, Chemistry, Manufacturing and Control

Diane Weiser
Senior Vice President, Corporate Communications and Investor Relations

Andrew A. Wolff, M.D., F.A.C.C.
Senior Vice President, Senior Fellow, Clinical Research and Development

Robert C. Wong
Vice President, Chief Accounting Officer

BOARD OF DIRECTORS

John T. Henderson, M.B., Ch.B.
Chairman, Cytokinetics, Incorporated, Former Vice President, Pfizer Pharmaceuticals Group

Robert I. Blum
President and Chief Executive Officer, Cytokinetics, Incorporated

Muna Bhanji
Former Senior Vice President, Global Market Access and Policy, Merck & Co., Inc.

Santo J. Costa
Former President and Chief Operating Officer, Quintiles Transnational Corporation

Robert A. Harrington, M.D.
Cardiologist, Professor of Medicine and Chair of the Department of Medicine at Stanford University

Edward M. Kaye, M.D.
Chief Executive Officer, Stoke Therapeutics, Inc.

B. Lynne Parshall, Esq.
Former Chief Operating Officer, Ionis Pharmaceuticals

Sandford D. Smith
Former Executive Vice President, Genzyme Corporation

Wendell Wierenga, Ph.D.
Former Executive Vice President, Research and Development, Santarus, Inc.

Nancy Wysenski
Former Executive Vice President and Chief Commercial Officer, Vertex Pharmaceuticals Incorporated

CORPORATE SECRETARY

John O. Faurescu, Esq.
Cytokinetics, Incorporated

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Ernst & Young LLP
Redwood City, California

CORPORATE COUNSEL

Cooley LLP
Palo Alto, California

REGISTRAR AND TRANSFER AGENT

Inquiries regarding change of address, lost stock certificates, changes in stock ownership and other matters related to stock ownership should be directed to the transfer agent.

Computershare
462 South 4th Street
Louisville, KY 40202

Phone (800) 837-8091

Foreign Shareholders (201) 680-6578

computershare.com/investor

ANNUAL MEETING

The annual meeting of stockholders will be held at 10:00 AM on May 10, 2023 at:

Cytokinetics, Incorporated
350 Oyster Point Blvd.
South San Francisco, CA 94080

COMMON STOCK

The company's common stock is traded on the NASDAQ Exchange, symbol: CYTK

STOCKHOLDER INQUIRIES

Stockholder and investor inquiries and requests for information should be directed to:

Investor Relations
Cytokinetics, Incorporated
350 Oyster Point Blvd.
South San Francisco, CA 94080
(650) 624-3060
investor@cytokinetics.com

CORPORATE INFORMATION

Cytokinetics, Incorporated
350 Oyster Point Blvd.
South San Francisco, CA 94080

Tel: (650) 624-3000
Fax: (650) 624-3010

cytokinetics.com

FORWARD-LOOKING STATEMENTS

This letter contains forward-looking statements for purposes of the Private Securities Litigation Reform Act of 1995 (the "Act"). Cytokinetics claims the protection of the Act's Safe Harbor for forward-looking statements. Examples of such statements include, but not limited to, statements, express or implied, relating to our or our partners' research and development and commercial readiness activities, including the initiation, conduct, design, enrollment, progress, continuation, completion, timing and results of any of our clinical trials, our ability to remedy any of the deficiencies contained in FDA's complete response letter to our NDA for *omecamtiv mecarbil* or obtain approval of *omecamtiv mecarbil* in any other jurisdiction, our ability to issue topline results of SEQUOIA-HCM in 2023, statements relating to the potential patient population who could benefit from *omecamtiv mecarbil, aficamten* or any of our other drug candidates; and statements relating to our cash balance at any particular date or the amount of cash runway such cash balance represents at any particular time. Such statements are based on management's current expectations, but actual results may differ materially due to various risks and uncertainties, including, but not limited to Cytokinetics' need for additional funding and such additional funding may not be available on acceptable terms, if at all; potential difficulties or delays in the development, testing, regulatory approvals for trial commencement, progression or product sale or manufacturing, or production of Cytokinetics' drug candidates that could slow or prevent clinical development or product approval; patient enrollment for or conduct of clinical trials may be difficult or delayed; the FDA or foreign regulatory agencies may delay or limit Cytokinetics' or its partners' ability to conduct clinical trials; Cytokinetics may incur unanticipated research and development and other costs; standards of care may change, rendering Cytokinetics' drug candidates obsolete; and competitive products or alternative therapies may be developed by others for the treatment of indications Cytokinetics' drug candidates and potential drug candidates may target. For further information regarding these and other risks related to Cytokinetics' business, investors should consult Cytokinetics' filings with the Securities and Exchange Commission, particularly under the caption "Risk Factors" in Cytokinetics' 2022 Annual Report on Form 10-K enclosed herewith.



350 Oyster Point Blvd.
South San Francisco, CA 94080

650 624 3000 tel

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