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, 2023
OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
FOR THE TRANSITION PERIOD FROM TO
Commission File Number 001-40602

ERASCA, INC.

(Exact name of Registrant as specified in its Charter)

Delaware	**83-1217027**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
3115 Merryfield Row, Suite 300 San Diego, CA	**92121**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (858) 465-6511

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, $0.0001 par value per share	ERAS	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 15(d) of the Act. YES ☐ NO ☒

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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 aggregate market value of the Registrant's common stock held by non-affiliates of the Registrant was approximately $297.0 million based on the closing price of the Registrant's common stock as reported on the Nasdaq Global Select Market of $2.76 per share on June 30, 2023, the last business day of the Registrant's most recently completed second quarter. Shares of common stock held by each executive officer and director and by each other person who may be deemed to be an affiliate of the Registrant have been excluded from this computation. The determination of affiliate status for this purpose is not necessarily a conclusive determination for other purposes.

The number of shares of Registrant's Common Stock outstanding as of March 21, 2024 was 151,494,161.

DOCUMENTS INCORPORATED BY REFERENCE

Certain sections of the Registrant's definitive proxy statement for the 2024 annual meeting of stockholders to be filed with the Securities and Exchange Commission pursuant to Regulation 14A not later than 120 days after the end of the fiscal year covered by this Form 10-K are incorporated by reference into Part III of this Form 10-K.

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PART I

Forward-Looking Statements and Market Data

This Annual Report on Form 10-K contains forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934, as amended (the Exchange Act), and Section 27A of the Securities Act of 1933, as amended (the Securities Act). All statements other than statements of historical facts contained in this Annual Report on Form 10-K, including statements regarding our future results of operations and financial position, business strategy, research and development plans, the anticipated timing, costs, design and conduct of our ongoing and planned preclinical studies and planned clinical trials for our product candidates, the timing and likelihood of regulatory filings and approvals for our product candidates, our ability to commercialize our product candidates, if approved, the impact of global geopolitical and economic events and war on our business, the pricing and reimbursement of our product candidates, if approved, the potential to develop future product candidates, the potential benefits of current and future licenses, acquisitions, and strategic arrangements with third parties, and our intent to enter into any future strategic arrangements, the timing and likelihood of success, plans and objectives of management for future operations, and future results of anticipated product development efforts, are forward-looking statements. These statements involve known and unknown risks, uncertainties and other important factors that may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. This Annual Report on Form 10-K also contains estimates and other statistical data made by independent parties and by us relating to market size and growth and other data about our industry. This data involves a number of assumptions and limitations, and you are cautioned not to give undue weight to such estimates. In addition, projections, assumptions and estimates of our future performance and the future performance of the markets in which we operate are necessarily subject to a high degree of uncertainty and risk.

In some cases, you can identify forward-looking statements by terms such as “may,” “will,” “should,” “expect,” “plan,” “anticipate,” “could,” “intend,” “target,” “project,” “contemplate,” “believe,” “estimate,” “predict,” “potential” or “continue” or the negative of these terms or other similar expressions. The forward-looking statements in this Annual Report on Form 10-K are only predictions. We have based these forward-looking statements largely on our current expectations and projections about future events and financial trends that we believe may affect our business, financial condition and results of operations. These forward-looking statements speak only as of the date of this Annual Report on Form 10-K and are subject to a number of risks, uncertainties and assumptions, including those described in Part I, Item 1A, “Risk Factors.” The events and circumstances reflected in our forward-looking statements may not be achieved or occur, and actual results could differ materially from those projected in the forward-looking statements. Moreover, we operate in an evolving environment. New risk factors and uncertainties may emerge from time to time, and it is not possible for management to predict all risk factors and uncertainties. Except as required by applicable law, we do not plan to publicly update or revise any forward-looking statements contained herein, whether as a result of any new information, future events, changed circumstances or otherwise. All forward-looking statements are qualified in their entirety by this cautionary statement, which is made under the safe harbor provisions of the Private Securities Litigation Reform Act of 1995.

This Annual Report on Form 10-K includes our trademarks as well as trademarks, tradenames and service marks that are the property of other organizations. Solely for convenience, trademarks and tradenames referred to in this Annual Report on Form 10-K appear without the ® and ™ symbols, but those references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights, or that the applicable owner will not assert its rights, to these trademarks and tradenames.

We maintain a website at www.erasca.com, to which we regularly post copies of our press releases as well as additional information about us. Our filings with the Securities and Exchange Commission (SEC) are available free of charge through our website as soon as reasonably practicable after being electronically filed with or furnished to the SEC. Information contained in our website does not constitute a part of this report or our other filings with the SEC.

Risk Factor Summary

Below is a summary of the principal factors that make an investment in our common stock speculative or risky. This summary does not address all of the risks that we face. Additional discussion of the risks summarized in this risk factor summary, and other risks that we face, can be found below under the heading “Risk Factors” in Item 1A of Part I of this Annual Report on Form 10-K, and should be carefully considered, together with other information in this Annual Report on Form 10-K and our other filings with the SEC before making investment decisions regarding our common stock.

- We have a limited operating history, have incurred significant operating losses since our inception and expect to incur significant losses for the foreseeable future. We may never generate any revenue or become profitable or, if we achieve profitability, we may not be able to sustain it.
- We will require substantial additional capital to finance our operations, and a failure to obtain this necessary capital when needed on acceptable terms, or at all, could force us to delay, limit, reduce or terminate our development programs, commercialization efforts or other operations.
- We are early in our development efforts and are only beginning to test our product candidates in clinical trials. If we are unable to successfully develop and commercialize our product candidates or experience significant delays in doing so, our business will be materially harmed.
- Our approach to the discovery and development of product candidates is unproven, and we do not know whether we will be able to develop any products of commercial value, or if competing approaches will limit the commercial value of our product candidates.
- Clinical and preclinical development involves a lengthy and expensive process with an uncertain outcome, and the results of preclinical studies and early clinical trials are not necessarily predictive of future results. Our product candidates may not have favorable results in clinical trials, if any, or receive regulatory approval on a timely basis, or at all.
- Any difficulties or delays in the commencement or completion, or termination or suspension, of our current or planned clinical trials could result in increased costs to us, delay or limit our ability to generate revenue and adversely affect our commercial prospects.
- Use of our product candidates could be associated with side effects, adverse events or other properties or safety risks, which could delay or preclude approval, cause us to suspend or discontinue clinical trials, abandon a product candidate, limit the commercial profile of an approved label or result in other significant negative consequences that could severely harm our business, prospects, operating results and financial condition.
- We rely on third parties to conduct many of our preclinical studies and clinical trials and to manufacture our product candidates, and these third parties may not perform satisfactorily.
- We face significant competition, and if our competitors develop technologies or product candidates more rapidly than we do or their technologies are more effective, our business and ability to develop and successfully commercialize products may be adversely affected.
- Our business is subject to risks arising from geopolitical and economic events.
- Our success depends on our ability to protect our intellectual property and our proprietary technologies.
- The trading price of the shares of our common stock could be highly volatile, and purchasers of our common stock could incur substantial losses.

Item 1. Business.

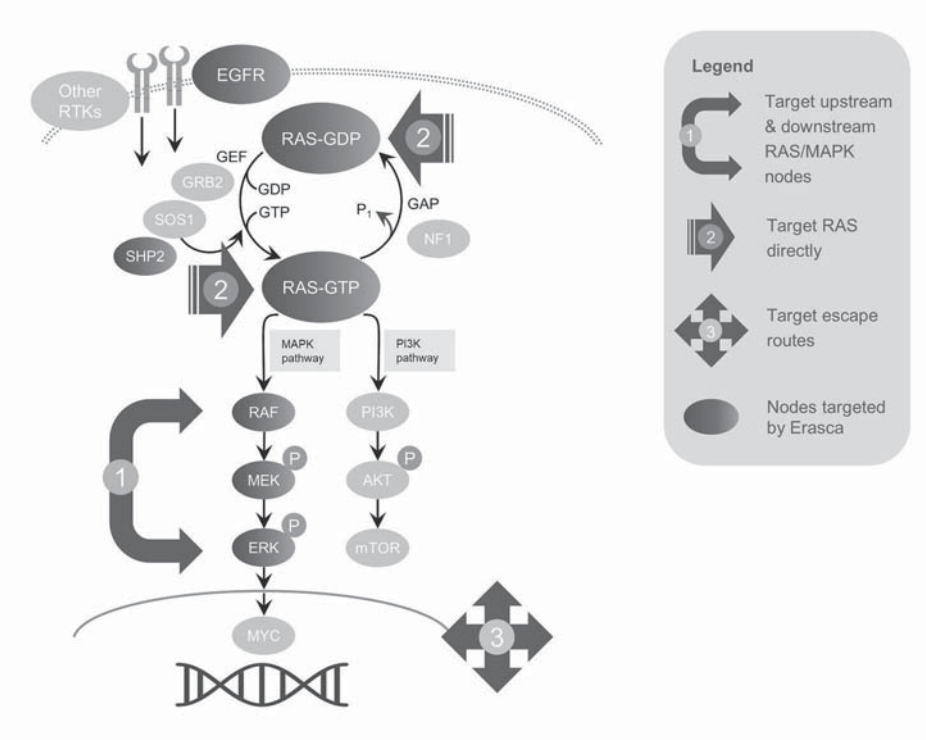
Overview

At Erasca, our name is our mission: to erase cancer.

We are a clinical-stage precision oncology company singularly focused on discovering, developing, and commercializing therapies for patients with RAS/MAPK pathway-driven cancers. Molecular alterations in RAS, the most frequently mutated oncogene, and the MAPK pathway, one of the most frequently altered signaling pathways in cancer, account for approximately 5.4 million new patients diagnosed with cancer globally each year. Our company was co-founded by leading pioneers in precision oncology and RAS targeting to create novel therapies and combination regimens designed to comprehensively shut down the RAS/MAPK pathway for the treatment of cancer. We have assembled one of the deepest, wholly-owned or controlled RAS/MAPK pathway-focused pipelines in the industry, which is focused on modality-agnostic programs aligned with our three therapeutic strategies of: (1) targeting key upstream and downstream signaling nodes in the RAS/MAPK pathway; (2) targeting RAS directly; and (3) targeting escape routes that emerge in response to treatment. The target breadth and molecular diversity represented in our pipeline enable us to pursue a systematic, data-driven, portfolio-wide clinical development effort to identify single agent and combination approaches with the goal of prolonging survival in numerous patient populations with high unmet medical needs.

Our modality-agnostic approach aims to allow us to selectively and potently target critical signaling nodes with the most appropriate modality, including small molecule therapeutics and large molecule therapeutics. Our purpose-built pipeline includes three clinical-stage programs (a pan-RAF inhibitor, an ERK inhibitor, and a central nervous system (CNS)-penetrant EGFR inhibitor), and additional discovery-stage programs targeting other key oncogenic drivers. We believe our world-class team's capabilities and experience, further guided by our scientific advisory board (SAB), which includes the world's leading experts in the RAS/MAPK pathway, uniquely position us to achieve our bold mission of erasing cancer.

Of the approximately 5.4 million new patients diagnosed globally per year with cancers driven by RAS/MAPK pathway molecular alterations, over 70% have limited or no targeted therapy treatment options. While the RAS/MAPK pathway has been well characterized and validated based on multiple compounds approved or in development targeting discrete signaling nodes in the cascade, most of these compounds face resistance and tolerability challenges, highlighting the need for new approaches to target this pathway. We believe that to effectively shut down a pathway that signals as promiscuously as RAS/MAPK, a holistic approach must be taken to target not just individual nodes, but multiple nodes and cooperative mechanisms in parallel. As depicted in the following figure and described below, we are pursuing three therapeutic strategies that may be used in combination with the goal of comprehensively, and perhaps synergistically, shutting down the RAS/MAPK pathway.

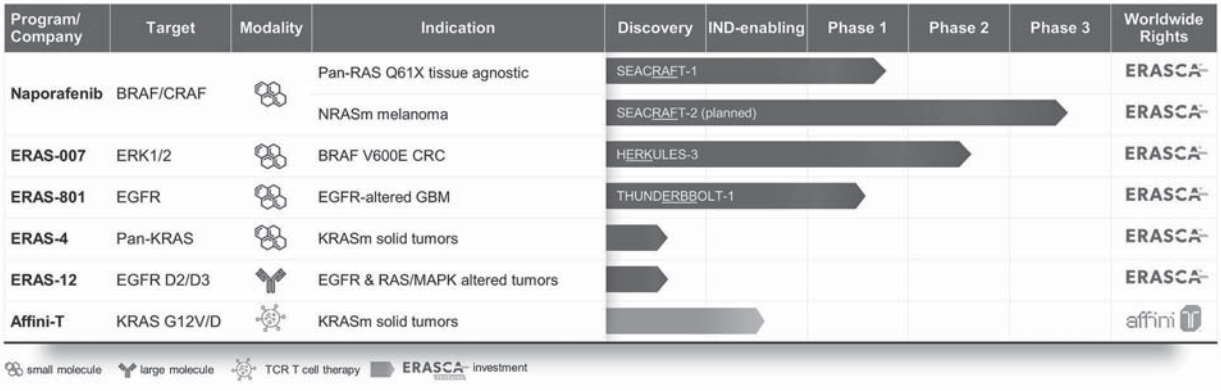


1. ***Target upstream and downstream MAPK pathway nodes with single agents and combinations intended to clamp these oncogenic drivers.*** For example, our lead product candidate, naporafenib, targets RAF, a key node of the RAS/MAPK pathway. We are developing naporafenib in combination with trametinib (MEKINIST) (MEK inhibitor) and other targeted therapies to delay emergence of resistance in response to RAS/MAPK pathway inhibition. We are also evaluating drug combinations targeting upstream and downstream nodes to shut down, or "clamp," the signaling of various oncogenic drivers, such as receptor tyrosine kinases (RTKs), NF1, RAS, RAF, and MEK alterations, trapped between the inhibited nodes. We refer to this approach as a "MAPKlamp." With this MAPKlamp approach, we hope to induce tumor regression in RAS/MAPK pathway-driven cancers, while also blocking the in-pathway escape routes that lead to tumor resistance.

2. ***Target RAS, the midstream MAPK pathway node, directly with single agents and combinations.*** We are discovering and developing molecules that have the potential to inhibit RAS in its inactive GDP state (RAS-GDP) as well as its more prevalent active GTP state (RAS-GTP). Utilizing our in-house discovery efforts employing structure-based drug design (SBDD), we are developing proprietary compounds against KRAS mutations beyond G12C, such as pan-KRAS (ERAS-4).

3. ***Target escape routes enabled by other proteins or pathways to further disrupt RAS/MAPK pathway signaling.*** RAS-driven cancers utilize escape routes, namely cooperative mechanisms, to develop resistance to targeted therapies. By shutting down these potential escape routes, we aim to provide more robust inhibition of oncogenic signaling.

To pursue these therapeutic strategies, we have assembled and are developing one of the deepest pipelines targeting multiple signaling nodes to shut down the RAS/MAPK pathway. We intend to study these agents either alone or in rational combinations across multiple relevant tumor types. The following table summarizes our current, wholly-owned or controlled, modality-agnostic pipeline to eradicate RAS/MAPK pathway-driven cancers, and programs that arise from an investment made by Erasca Ventures, LLC (Erasca Ventures) in a third party.



Our lead product candidate is naporafenib, for which we plan to initiate a pivotal Phase 3 trial in the first half of 2024 for patients with NRAS-mutated (NRASm) melanoma. We dosed the first patient in a Phase 1b trial in August 2023 for patients with RAS Q61X solid tumors to inform additional clinical development pathways for naporafenib. Naporafenib is a pan-RAF inhibitor with first-in-class and best-in-class potential for patients with NRASm melanoma, RAS Q61X solid tumors, and other RAS/MAPK pathway-driven tumors. RAF proteins are ubiquitously expressed serine-threonine kinases that constitute a key node of the RAS/MAPK pathway downstream of RAS and upstream of MEK. The RAF protein family consists of ARAF, BRAF, and CRAF (RAF1) that are activated through dimerization. Mutations in RAF proteins have been observed in many cancers, such as melanoma, colorectal cancer (CRC), non-small cell lung cancer (NSCLC), and thyroid cancer. We in-licensed naporafenib from Novartis Pharma AG (Novartis) in December 2022. Naporafenib has been dosed in over 500 patients to date, whereby safety, tolerability, pharmacokinetics (PK), and pharmacodynamics (PD) have been established in both monotherapy and select combinations, with clinical proof-of-concept (PoC) data in combination with trametinib for patients with NRASm melanoma, which includes NRAS Q61X melanoma, and preliminary clinical PoC data in combination with trametinib for patients with RAS Q61X NSCLC. In December 2023, we announced that the US Food and Drug Administration (FDA) granted Fast Track Designation (FTD) to naporafenib in combination with trametinib for the treatment of adult patients with unresectable or metastatic melanoma who have progressed on, or are intolerant to, an anti-programmed death-1 (ligand 1) (PD-(L)1)-based regimen, and whose tumors contain an NRAS mutation (NRASm). Programs that receive FTD may benefit from early and frequent interactions with the FDA during the clinical development

process and, if relevant criteria are met, the FDA may consider reviewing portions of a marketing application before the sponsor submits the complete application.

We are pursuing a broad development strategy for naporafenib, which includes our SEACRAFT trials designed to evaluate naporafenib's development opportunities in combination with other targeted therapies. We are prioritizing rapid development for naporafenib plus trametinib in the Phase 1b SEACRAFT-1 trial for patients with RAS Q61X solid tumors, which dosed its first patient in August 2023, and in the planned Phase 3 SEACRAFT-2 trial for patients with NRASm melanoma. SEACRAFT-1 is supported by clinical PoC data in patients with NRAS Q61X melanoma and preliminary clinical PoC data in patients with KRAS Q61X NSCLC. SEACRAFT-2 is supported by clinical PoC data in patients with NRASm melanoma, as presented by Novartis at the European Society for Medical Oncology Congress 2022 (ESMO Congress 2022) medical conference and as published in March 2023 by de Braud et al. in the *Journal of Clinical Oncology*. In connection with our SEACRAFT-1 and -2 trials, we have announced clinical trial collaboration and supply agreements (CTCSAs) with Novartis for its MEK inhibitor, trametinib (MEKINIST). We are sponsoring and funding the clinical trials and Novartis is providing its drug to us free of charge.

Our next most-advanced product candidate is ERAS-007 (our oral ERK1/2 inhibitor), which targets the most distal node of the RAS/MAPK pathway. The extracellular signal-regulated kinases (ERK), ERK1 and ERK2, belong to a family of serine-threonine kinases that regulate cellular signaling. ERK proteins propagate signaling for multiple cellular functions involved in cell growth and differentiation, which are often overactivated in RAS/MAPK pathway-driven cancers. We in-licensed ERAS-007 from Asana BioSciences (Asana) based in part on preclinical studies that demonstrated the highest potency and longest target residence time of any ERK inhibitors of which we are aware. ERAS-007 was evaluated as a single agent in a Phase 1 clinical trial in patients with advanced solid tumors completed by Asana. Forty-nine patients were enrolled and administered ERAS-007 once a day (QD) or once weekly (QW). Objective responses were observed at doses from 120 mg to 250 mg QW in patients with multiple tumor types (melanoma, salivary gland tumor, NSCLC, and thyroid cancer) that all harbor alterations (BRAF, HRAS, and NRAS) in the RAS/MAPK pathway, supporting the development of ERAS-007 QW as a combination therapy in patients with diverse, biomarker-selected tumor types. In this trial, ERAS-007 demonstrated a reversible and manageable adverse event profile.

We have developed a clinical development plan that has included multiple tumor types for ERAS-007, which we refer to as our HERKULES series of clinical trials. In September 2021, we dosed the first patient in HERKULES-3, a Phase 1b/2 master protocol clinical trial for ERAS-007 in combination with various agents in patients with gastrointestinal (GI) cancers. In connection with our HERKULES-3 trial, we have announced CTCSAs with Pfizer Inc. for its BRAF inhibitor, encorafenib (BRAFTOVI), Eli Lilly and Company (Lilly) for its EGFR antibody, cetuximab (ERBITUX), and Pierre Fabre for its BRAF inhibitor, encorafenib (BRAFTOVI), in key international territories. In all these cases, we are sponsoring and funding the clinical trial and the partner is providing its drug to us free of charge.

The master protocol for the HERKULES-3 Phase 1b/2 clinical trial provides the flexibility to explore additional combinations and expand into other GI cancer indications. In May 2023, we announced encouraging preliminary data for the ERAS-007 combination with encorafenib and cetuximab (EC) in patients with EC-naïve BRAFm CRC in a poster presentation that we presented at the American Society of Clinical Oncology Annual Meeting in June 2023.

In June 2023, we provided updates with respect to our HERKULES-1 trial (for patients with solid tumors caused by RAS/MAPK pathway alterations), HERKULES-2 trial (for patients with EGFR-mutated or KRAS-mutated NSCLC), and one of the sub-studies of our HERKULES-3 trial (for patients with KRAS- or NRAS-mutant CRC and KRAS-mutant PDAC). These updates consisted of the following:

- **HERKULES-1: ERAS-007 plus ERAS-601 in patients with advanced solid tumors:** We have deprioritized evaluation of this combination as dose escalation safety data do not support continued evaluation of the regimen tested

- **HERKULES-2: ERAS-007 plus osimertinib in patients with post-osimertinib EGFR-mutant NSCLC:** We have deprioritized evaluation of this combination in this indication as clinical efficacy data do not support continued evaluation

- **HERKULES-3 sub-study that consisted of ERAS-007 plus palbociclib in patients with KRAS- or NRAS-mutant CRC and KRAS-mutant PDAC:** We have deprioritized evaluation of this combination in this indication as clinical efficacy data do not support continued evaluation

As a result of these deprioritizations, we are no longer enrolling patients in the HERKULES-1 trial, the HERKULES-2 trial, or the HERKULES-3 sub-study that consisted of ERAS-007 plus palbociclib described above.

With respect to the HERKULES-3 Phase 1b trial for ERAS-007 plus EC in EC-naïve BRAFm CRC patients, we anticipate a Phase 1b dose expansion data readout in the first half of 2024.

Our third clinical program is ERAS-801, an investigational CNS-penetrant EGFR inhibitor. In February 2022, we dosed the first patient in our THUNDERBBOLT-1 Phase 1 clinical trial for ERAS-801 in patients with recurrent glioblastoma (GBM). In May 2023, we announced that the FDA granted FTD to ERAS-801 for the treatment of adult patients with GBM with EGFR gene alterations. In June 2023, we announced that the FDA granted Orphan Drug Designation (ODD) to ERAS-801 for the treatment of patients with malignant glioma, which includes GBM. Provided that the product candidate is approved by the FDA for the orphan-designated disease or condition, ODD entitles a party to the potential for seven years of post-approval marketing exclusivity, subject to certain exemptions, and financial incentives such as tax advantages and user fee waivers. In November 2023, we announced that a maximum tolerated dose (MTD) was identified for ERAS-801. We anticipate presenting Phase 1 monotherapy data from THUNDERBBOLT-1 in 2024.

In June 2023, we announced that we deprioritized ERAS-3490, our CNS-penetrant KRAS G12C inhibitor, due to the increasingly competitive landscape for small- and mid-cap biopharma companies in the KRAS G12C inhibitor market, despite the program's potential for differentiation in this market.

In November 2023, we announced that we deprioritized the FLAGSHP-1 Phase 1b combination trial of ERAS-601 SHP2 inhibitor with cetuximab (ERBITUX). Though ERAS-601 achieved confirmed responses as a monotherapy and in combination with cetuximab, preliminary data did not justify further development of this combination in the FLAGSHP-1 indications.

We are also advancing additional programs targeting key oncogenic drivers in the RAS/MAPK pathway, which we will need to successfully progress through discovery and IND-enabling activities prior to advancing these programs into clinical development, if at all.

Our core values, team, and social mission

We are a team of experienced drug discoverers, developers, and company builders who are united by our mission to erase cancer and passionate about creating potentially life-saving precision oncology medicines singularly focused on targeting the RAS/MAPK pathway. Our leadership team has broad and deep experience in oncology, including advancing therapeutic candidates from discovery research to clinical development, regulatory approval, and commercialization. Our core values are embodied by our quest for the CURE:

Dr. Jonathan Lim, our Chairman, CEO, and Co-Founder, has helped pioneer transformative advancements in precision oncology and drug delivery, including leading Ignyta's trailblazing pursuit of a global tissue agnostic label for ROZLYTREK, which became the first drug in biopharmaceutical history to achieve the unprecedented triple crown of breakthrough designations with BTD (FDA), PRIME (EMA) and Sakigake (PMDA). He has served as Chairman and/or CEO and founding investor of six biotechnology companies that have collectively achieved global regulatory approval and launch of seven therapeutic products in oncology, immunology, and drug delivery, benefitting thousands of patients worldwide.

Dr. Michael Varney, our Chair of R&D, SAB member, and a member of our board of directors, is a pioneer drug discoverer and biotech leader. His leadership at Agouron resulted in the discovery of multiple currently marketed anti-cancer agents, including XALKORI and INLYTA. As Executive Vice President and Head of Genentech's Research and Early Development (gRED) and a member of the Roche Corporate Executive Committee, he was responsible for all aspects of gRED innovation, drug discovery and development, and built a team-based organization that today contributes to more than 40% of Genentech's development portfolio, including the marketed anti-cancer agents ERIVEDGE and COTELLIC. Under his leadership, gRED teams discovered and developed successful medicines that include VENCLEXTA with AbbVie, the first BCL-2 inhibitor, and POLIVY, an antibody drug conjugate for the treatment of diffuse large B-cell lymphoma.

Dr. Shannon Morris, our Chief Medical Officer, initially joined us as Senior Vice President of Clinical Development and was promoted to Chief Medical Officer in April 2023. She has more than 20 years of experience in the life sciences industry with a focus in oncology drug development, including contributions in both early and late phase development, as well as in both targeted and immune-based therapies. Prior to joining Erasca, she was responsible for the clinical development of lerapolturev, a novel poliovirus-based therapeutic targeting GBM, at Istari Oncology. Prior to Istari, she was the clinical lead for the approval of COSELA. During her time at GSK and MedImmune, she held positions of increasing responsibility and was involved in the development of a number of molecules, including the early development of MEKINIST, and supported the successful biologics license application for IMFINZI in bladder cancer.

Dr. David Chacko, our Chief Financial Officer and Chief Business Officer, joined us from Versant Ventures, where he was a Principal with both investing and operating responsibilities. He helped lead investment opportunities across multiple therapeutic areas and advanced several Versant portfolio companies operationally through company formation, fundraising, corporate and business development, and clinical and regulatory activities. His prior roles at Alcon/Novartis, McKinsey, SR One, and Morgan Stanley bring to Erasca deep experience in strategy, finance, fundraising, business development, and operations.

Many members of our leadership team have worked together previously at Ignyta or Roche/Genentech, or have joined us from other leading companies in the biopharmaceutical and life science tools sectors such as Illumina, Lilly, Medivation, Merck, Myovant, Neurocrine, Pfizer, and Turning Point, and have worked on numerous oncology drugs that have been approved and launched for the benefit of patients.

Dr. Lim founded Erasca with Dr. Kevan Shokat (Professor and Chair of the Department of Cellular and Molecular Pharmacology at UCSF; Professor of Chemistry at the University of California, Berkeley; and an investigator at the Howard Hughes Medical Institute). In addition to Dr. Shokat, our SAB includes the following RAS/MAPK pathway experts:

- Dr. Stephen Blacklow is a world expert in SHP2 who helped pioneer development of the first SHP2 inhibitor with Novartis, and is the Gustavus Adolphus Pfeiffer Professor of Biological Chemistry and Molecular Pharmacology, Biological Chemistry and Molecular Pharmacology at Harvard Medical School; a Professor of Pathology at the Brigham And Women's Hospital; a Professor of Cancer Biology at the Dana-Farber Cancer Institute; and the Chair of the Department of Biological Chemistry and Molecular Pharmacology at Harvard Medical School.
- Dr. Karen Cichowski is a world expert in RAS/MAPK pathway signaling, including elucidating how deregulated cell signaling drives tumorigenesis in nervous system, lung, prostate, and breast cancers, combining translational mouse modeling techniques with basic biochemical and cell biological studies, and in identifying novel combination therapies to shut down aberrant RAS/MAPK pathway signaling. She is Professor of Medicine at Harvard Medical School and Professor of Medicine/Genetics at Brigham and Women's Hospital.
- Dr. Ryan Corcoran is a gastrointestinal oncologist with a primary interest in translational oncology research who focuses on targeted therapies directed against mutations commonly found in human cancers, such as BRAF and KRAS mutations. He also is a world expert in ERK, having studied nearly every ERK inhibitor that has been or is being developed in the field. He is also the Director of the Gastrointestinal Cancer Center Program; the Scientific Director of the Termeer Center for Targeted Therapy at Massachusetts General Hospital Cancer Center; and an Associate Professor of Medicine at Harvard Medical School.
- Dr. George Demetri is a world expert in targeted oncology therapies who pioneered the development of GLEEVEC that helped launch the revolution in precision oncology. He is the Director of the Center for Sarcoma and Bone Oncology at the Dana-Farber Cancer Institute; the Director of the Ludwig Center at the Dana-Farber/Harvard Cancer Center; and Executive Director for Clinical and Translational Research at the Ludwig Institute for Cancer Research.

- Dr. Pablo Rodriguez-Viciana is a world expert in the RAS/MAPK pathway whose major focus is the function of the SHOC2 phosphatase complex as a unique regulatory node required for efficient RAS/MAPK pathway activation in the context of diseases such as cancer and RASopathies. He has served as the group leader at the UCL Cancer Institute since 2008 and is a former postdoctoral researcher in Dr. Frank McCormick's lab at the University of California, San Francisco.
- Dr. Michael Varney is a pioneer drug discoverer and biotech leader and the former Executive Vice President and Head of Genentech's gRED and a former member of the Roche Corporate Executive Committee.

At Erasca, while our mission to erase cancer inspires us, we know we can do more to make an even broader contribution to society. To that end, we are pursuing environmental, social, and governance (ESG) initiatives that are aligned with our core mission.

- **Erasca Foundation:** In May 2021, we established the Erasca Foundation, a nonprofit California public benefit corporation, which was funded by the donation of 1,093,557 shares of our common stock (which at the time represented 1% of our capital stock), in conjunction with our initial public offering (IPO). In 2023, the Erasca Foundation provided funding for initiatives to positively impact society, including providing funding to Life Science Cares, Curebound Cancer Research, and Lazarex Cancer Foundation.
- **Environmental initiatives:** Both of our physical buildings limit their carbon footprint. Our San Diego office is Gold Level Leadership in Energy and Environmental Design (LEED) certified, and our San Francisco office is Platinum Level LEED certified. Each building is easily accessible by public transportation and has electric vehicle charging stations and indoor bike racks. We also encourage our employees to recycle, including recycling programs for a subset of our lab supplies. While we rely on third-party vendors to conduct our drug manufacturing, our chemists that are engaged in the manufacturing process are committed to increasing efficiencies, reducing materials, and minimizing waste.
- **Code of Conduct and Ethics:** Our Code of Business Conduct and Ethics applies to all of our employees, officers and directors, and requires the highest standards of business ethics. The Code of Business Conduct and Ethics and other corporate governance documents are located in the "Corporate Governance" section of the "Investors" page of our website located at www.erasca.com.
- **Inclusive clinical trial participation:** We intend to make clinical trials of our product candidates more accessible to diverse patient populations and plan to partner with others who are like-minded in this regard.
- **Drug access program:** If our products become commercially available**,** we intend to pursue initiatives to provide patients with access to such drugs, including through patient assistance programs and compassionate use programs.

Our corporate strategies to erase cancer

Our mission is to erase cancer by eradicating RAS/MAPK pathway-driven cancers. Our corporate strategies to achieve our mission include:

- ***Relentlessly focus on patients and society in our mission to erase cancer.*** There are approximately 5.4 million new patients diagnosed globally per year with cancers driven by RAS/MAPK pathway alterations, over 70% of whom have limited or no targeted therapy treatment options. We are a team of experienced drug discoverers, developers, and company builders who are united by our mission to erase cancer and passionate about creating potentially life-saving precision oncology medicines.
- ***Develop novel single agent and combination regimens to comprehensively shut down the RAS/MAPK pathway for the treatment of cancer.*** We are pursuing three therapeutic strategies that may be used in combination to comprehensively, and perhaps synergistically, shut down the RAS/MAPK pathway: (1) target upstream and downstream MAPK pathway nodes with single agents and combinations intended to clamp these oncogenic drivers; (2) target RAS directly with single agents and combinations; and (3) target escape routes enabled by other proteins or pathways to further disrupt RAS/MAPK pathway signaling. Our strategic focus on the RAS/MAPK pathway allows us to comprehensively target critical nodes in the pathway that could drive cancer signaling.
- ***Advance our deep, modality-agnostic RAS/MAPK pathway-focused pipeline.*** Our internally and externally sourced RAS/MAPK pathway-focused pipeline, comprising several targeted therapy programs, is one of the deepest in the industry. Our modality-agnostic approach aims to selectively and potently target critical

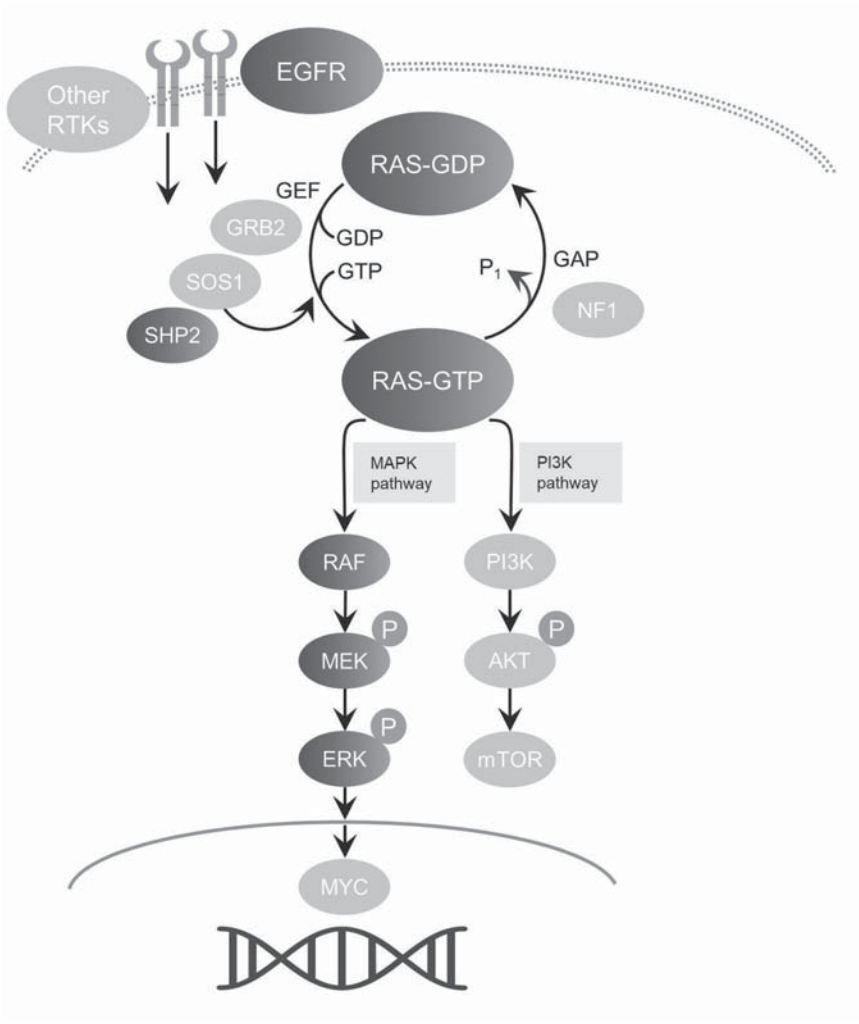
RAS/MAPK signaling nodes with the appropriate modality, including small molecule therapeutics and large molecule therapeutics. Naporafenib (our pan-RAF inhibitor), ERAS-007 (our ERK inhibitor), and ERAS-801 (our CNS-penetrant EGFR inhibitor) are currently being studied in clinical trials. Given the high unmet medical need of the patients we seek to treat, we will continually evaluate the potential for expedited development and review pathways.

- ***Internally and externally source, on a global basis, potentially disruptive programs targeting RAS/MAPK pathway alterations.*** We have built a productive and efficient internal discovery engine. Our world-class structural biology team generates on average more than 100 protein structures annually and we use computational biology and computational chemistry to accelerate our discovery activities. While we have strong internal capabilities, we also believe that innovation is a collective, global endeavor and a single platform is unlikely to discover all the best ideas and approaches. We therefore plan to continue to opportunistically evaluate synergistic, in-pathway opportunities, regardless of origin, that meet our high scientific bar. Our extensive network and relationships provide us preferential—and at times exclusive—access to certain assets of interest.
- ***Lead the next revolution in precision oncology.*** The first wave of precision oncology included tyrosine kinase inhibitors such as ROZLYTREK, approved for select tumors that harbor ROS1 or NTRK fusions. While these initial development efforts focused on specific disease-causing alterations in areas of high unmet medical need, these patient populations were modest in size. We believe that to effectively shut down a pathway that signals as promiscuously as RAS/MAPK and encompasses a range of alterations, a holistic approach must be taken to target not just specific individual mutations, but multiple alterations and cooperative mechanisms in parallel. We are pursuing tissue agnostic and tissue specific indications using flexible trial designs intended to efficiently transition molecules through each phase of development with the goal of identifying early efficacy signals warranting additional resource allocation for both monotherapy and combination approaches.
- ***Evaluate opportunities to accelerate development timelines and enhance the commercial potential of our programs in collaboration with third parties***. We own or control worldwide development and commercialization rights to our entire pipeline of targeted therapy programs. This provides us with the flexibility to explore combinations of our agents with each other, other investigational agents, and/or standard of care therapies. We intend to continue evaluating opportunities to work with partners that meaningfully enhance our capabilities with respect to the development and commercialization of our product candidates. In addition, we intend to commercialize our product candidates in the United States. We intend to explore partnerships in selected geographies to maximize the worldwide commercial potential of our programs.

Our singular focus on the RAS/MAPK pathway

Background

The RAS/MAPK pathway is one of the most frequently altered signaling pathways in cancer. Molecular alterations in key signaling nodes within the RAS/MAPK pathway have been shown to drive cell proliferation across a wide range of tumor types. As described further below, our wholly-owned or controlled pipeline targets all of the key signaling nodes colored in purple, either directly or indirectly as single agents and in combination in order to prolong survival in a wide range of patient populations.



EGFR

RTKs like EGFR are proteins that are embedded in the cell membrane and relay growth signals from the outside environment to the cell's internal machinery. At rest, these proteins reside on the cell membrane as inactive monomers. Growth factors secreted by nearby cells bind to specific RTKs, such as epidermal growth factor (EGF) binding to EGFR, and cause these RTKs to dimerize. Dimerized RTKs activate one another through transphosphorylation of their intracellular regions. Intracellular proteins, such as adapter proteins, bind to these phosphorylated regions and propagate the pro-growth signals within the cell via one or more signaling pathways. Cells express a variety of RTKs so that environmental cues can be relayed to specific cell populations in specific contexts. EGFR mediates pro-growth signaling in skin and in the ducts and outer surfaces of many organs.

Overactive RTK signaling can result in uncontrolled cell growth and survival that transforms normal cells into cancer cells.

SHP2

SHP2 is a protein tyrosine phosphatase and a key positive regulator of the growth signals from the RTK growth factor receptors to the intracellular signaling pathways (including RAS/MAPK and PI3K) that promote growth and survival of normal cells and cancer cells. As such, SHP2 is a convergent node for upstream RTK signaling, such that activated SHP2 upregulates ("turns up") the positive signals and downregulates ("turns down") the negative signals in the signaling cascades. SHP2 also serves as a central node in relaying the growth and survival signals from RTKs such as EGFR to RAS/MAPK and other intracellular pathways. SHP2 is an attractive target because SHP2 inhibition ubiquitously blocks the growth signals from multiple RTKs, thereby preventing cancer cells from bypassing the blockade on a specific RTK (e.g., EGFR inhibitor) through activation of other RTK growth factor receptors (e.g., MET).

NF1

NF1, or neurofibromin, is a protein that accelerates the transition of RAS proteins from the active RAS-GTP state to the inactive RAS-GDP state. NF1 is classified as a GTPase activating protein (GAP) because it boosts the ability of RAS to hydrolyze bound GTP to GDP. Although RAS can autonomously hydrolyze GTP, it is dependent on GAPs such as NF1 to rapidly cycle it from the active state to the inactive state and thereby prevent overactive signaling. If NF1 is inactivated due to a mutation (NF1 loss-of-function mutation), RAS proteins may spend more time in the active RAS-GTP state. This can result in hyperactive RAS/MAPK pathway activation that drives aberrant cell growth and ultimately tumorigenesis. This is observed in patients affected by a genetic disorder caused by somatic mutations in the NF1 gene called neurofibromatosis type 1. NF1 loss-of-function mutations are observed in a variety of cancers, including melanoma and CRC, where they activate RAS/MAPK signaling alone or in conjunction with other RAS/MAPK pathway activating mutations.

RAS

RAS proteins are ubiquitously expressed GTPase proteins. The RAS protein family consists of KRAS, NRAS, and HRAS proteins and acts as the entry node in the RAS/MAPK signaling pathway. KRAS is the most abundantly expressed RAS protein followed by NRAS and then HRAS. RAS proteins act as signaling transducers since they are recruited to activated RTK complexes where they are converted into an active conformation (RAS-GTP) that enables them to activate downstream effector proteins, such as RAF proteins. The activation state of a RAS protein is dictated by the phosphorylation state of the bound guanosine; RAS adopts an inactive RAS-GDP conformation when bound to GDP and an active RAS-GTP conformation when bound to GTP. Conversion of RAS into an active conformation is mediated by binding to co-factor proteins, e.g., SOS1, and these co-factor proteins enable the exchange of the RAS-bound nucleotide from GDP to GTP. In the active state, RAS-GTP proteins interact with multiple effector proteins to propagate cell signaling through multiple pathways. For example, activated RAS-GTP proteins interact with RAF proteins to activate MAPK signaling, and PI3K proteins to activate PI3K pathway signaling. RAS can transition from the active state into the inactive state by hydrolyzing its bound nucleotide from GTP to GDP either intrinsically or catalyzed through interactions with co-factor proteins, such as NF1. RAS proteins are the most frequently mutated oncoproteins in cancer. These mutations occur at hotspots, such as amino acid residues 12, 13, and 61, and these hotspot mutations impair RAS's ability to hydrolyze GTP to GDP. As a result, mutant RAS-GTP remains in the active state for prolonged periods of time resulting in hyperactive stimulation of the RAS/MAPK and other pathways.

RAF

RAF proteins are ubiquitously expressed serine-threonine kinases that are a part of the RAS/MAPK pathway and whose activity is regulated by RAS proteins. The RAF protein family consists of ARAF, BRAF, and CRAF (RAF1). In the absence of activated RAS-GTP, RAF proteins assume an autoinhibited conformation in complex with downstream effector proteins, MEK1 and MEK2. RAF proteins can homodimerize (e.g., BRAF-BRAF dimers) or heterodimerize (e.g., CRAF-BRAF dimers). When RAF proteins bind to activated RAS-GTP, they adopt an active conformation that results in activation of their kinase domains. The activated kinase domains then phosphorylate complexed MEK proteins, activating those proteins and releasing them from the RAF-MEK complex. Activated MEK then signals further down the RAS/MAPK pathway. Mutations in RAF proteins, especially in BRAF, have been observed in many cancers, such as melanoma, CRC, NSCLC, and thyroid cancer. For example, the BRAF V600E mutation (a class I BRAF mutation) is frequently observed in melanoma and this mutation enables BRAF to constitutively activate MEK as a monomer. Approved BRAF inhibitors for class I mutations include vemurafenib, dabrafenib, and encorafenib. Class II BRAF mutations enable BRAF to constitutively dimerize and activate MEK. Class III BRAF mutations impair the ability of the mutant BRAF protein to phosphorylate MEK, but class III mutant BRAF proteins can aberrantly dimerize with wildtype RAF proteins and enable their dimerized wildtype RAF partners to activate MEK. To our knowledge, there are no approved inhibitors of BRAF Class II or Class III mutations. A number of inhibitors targeting BRAF Class II and Class III mutations, as well as pan-RAF inhibitors designed to disrupt wildtype RAF signaling, are in development; however, to our knowledge, none have received regulatory approval.

MEK

MEK1 and MEK2 proteins are ubiquitously expressed serine-threonine kinases that are activated by RAF-mediated phosphorylation and signal downstream by activating ERK proteins. MEK1 and MEK2 proteins form complexes with RAF proteins in the inactive state and are recruited as a unit to activated RAS-GTP. RAS-GTP then activates the RAF-MEK complex by binding to RAF, which then activates MEK via phosphorylation and releases from the RAF-MEK complex.

Activated MEK then selectively phosphorylates ERK1 and ERK2 proteins, which are the terminal nodes of the RAS/MAPK pathway. Currently approved MEK inhibitors, such as trametinib, binimetinib, cobimetinib, and selumetinib, allosterically bind MEK proteins and inhibit MEK activation, either as free proteins alone or in complex with RAF. The inhibition of RAS/MAPK signaling by MEK inhibitors can result in an upregulation of signaling upstream of MEK due to negative feedback loops within the RAS/MAPK pathway. This increased signaling pressure can overwhelm MEK inhibitors and result in reactivation of MAPK signaling. Most MEK inhibitors are approved in combination with a BRAF inhibitor partially due to their vulnerability of being overwhelmed by the reactivation of MAPK signaling. In this combination, BRAF inhibitors attenuate upstream signaling pressure on MEK inhibitors, and MEK inhibitors further limit downstream MAPK signaling not inhibited by the BRAF inhibitor.

ERK

The extracellular signal-regulated kinases (ERK), ERK1 and ERK2, are ubiquitous serine-threonine kinases that regulate cellular signaling in both physiological and pathological states and comprise the terminal node of the RAS/MAPK pathway. Once activated by MEK, ERK proteins phosphorylate thousands of downstream proteins, propagating RAS/MAPK signaling across multiple cellular functions. In contrast to currently approved allosteric MEK inhibitors, ERK inhibitors in development are ATP-competitive and as a result, their potency is robust against the activated state of ERK. Based on this property, ERK inhibitors potentially can overcome drug resistance mechanisms that involve reactivation of RAS/MAPK pathway signaling, such as a rebound of RAS/MAPK signaling resulting from the alleviation of negative feedback or an upstream RAS/MAPK pathway protein adopting an acquired resistance mutation.

Patient lives at stake annually with RAS/MAPK pathway alterations

At Erasca, we are on a bold mission to erase cancer. The journey will be long, and it won't be easy. But patients with cancer are waiting, and we are eager to make new therapies available as soon as possible. Our mission will involve delivering new therapies to patients in markets where there are limited or no approved targeted therapies, which are referred to as "blue oceans" (adapted from *Blue Ocean Strategy* by Chan Kim & Renée Mauborgne), as well as markets where there are already approved or soon to be approved product offerings, or "red oceans." Of the approximately 5.4 million new patients diagnosed globally per year with cancers driven by RAS/MAPK pathway alterations, over 70% (approximately 4 million patients) are in blue oceans with limited or no targeted therapy treatment options. We intend to commercialize our product candidates in the United States. In other parts of the world, we intend to explore partnerships in selected geographies to maximize the worldwide commercial potential of our programs.

New cases estimated worldwide per annum (thousands; numbers may not add up due to rounding)

Alterations	GBM	HNSCC	NSCLC	CRC	Melanoma	PDAC	Other solid tumors	US	EU	ROW	Global
EGFR*	125	513	184	338	-	-	-	74	209	876	1,159
NF1	25	58	98	34	33	1.9	434	75	158	451	684
KRAS G12C	-	2.8	240	57	-	5.1	45	36	82	232	349
KRAS G12D	0.2	4.7	68	238	0.5	178	201	65	171	455	691
N/H/KRAS Q61X	0.4	23	35	80	69	32	155	51	105	239	394
Other K/N/HRAS	0.6	40	168	457	6	211	344	114	297	817	1,228
BRAF V600E/K	2.0	1.9	23	180	93	1.4	158	63	127	271	461
BRAF Class 2/3	0.5	4.7	29	24	7.9	0.5	86	17	38	98	153
Other BRAF	-	-	3.9	-	1.9	0.3	0.5	0.7	1.0	4.9	6.6
MEK	0.2	1.9	12	8.8	4.6	0.2	22	5.2	11	33	50
Co-occurring activating MAPK pathway alterations**	1.4	10	62	59	37	7.1	84	32	68	160	261
US	12	29	93	114	77	51	153	533			
EU	34	76	194	398	116	124	324		1,267		
Rest of World	109	555	635	964	60	264	1,053			3,636	
Global	155	660	923	1,476	253	438	1,530				5,436

Blue ocean opportunities Red ocean opportunities

* Post-Osimertinib resistant population shown for EGFRm NSCLC except for SCLC transformation
** Co-occurring activating MAPK pathway alterations exclude EGFR overexpression
Source: SEER database (2020), ECIS database (2020), GLOBOCAN database (2020), The AACR Project GENIE Consortium version 8.1 (2020), TCGA Research Network: https://www.cancer.gov/tcga, Tyner JW et al. (2018) PMID: 30333627, Brenner CW et al (2013) PMID: 24120142, Chen J et al. (2020) PMID: 32015526, and Ostrom QT, et al. (2020) PMID: 33123732

Our therapeutic strategies for shutting down the RAS/MAPK pathway

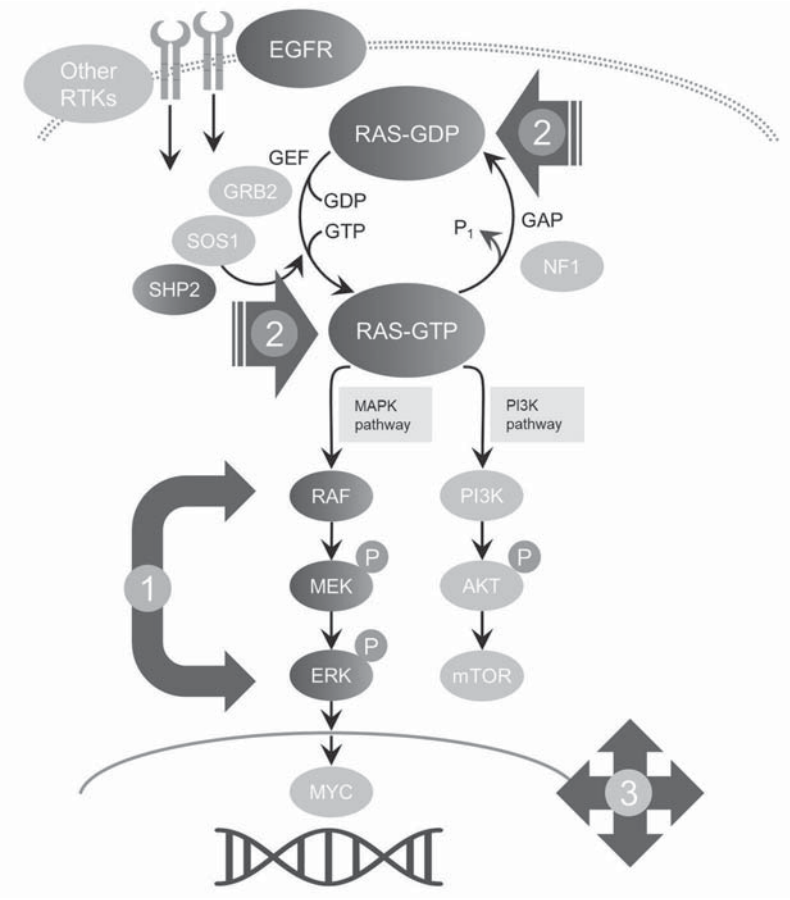
We believe that to effectively shut down a pathway that signals as promiscuously as RAS/MAPK, a holistic approach must be taken to target not just single nodes, but multiple nodes and cooperative mechanisms in parallel. Our internally and externally sourced RAS/MAPK pathway-focused pipeline, comprising several targeted therapy programs, is one of the deepest in the industry. The target breadth and molecular diversity represented in our pipeline enable us to pursue a systematic, data-driven, portfolio-wide clinical development effort to identify single agent and combination approaches that aim to prolong survival in numerous patient populations with high unmet medical needs. We are pursuing three therapeutic strategies that may be used in combination with the goal of comprehensively, and perhaps synergistically, shutting down the RAS/MAPK pathway:

1. ***Target upstream and downstream MAPK pathway nodes with single agents and combinations intended to clamp these oncogenic drivers.*** For example, our lead product candidate, naporafenib, targets RAF, a key node of the RAS/MAPK pathway. We are developing naporafenib in combination with the MEK inhibitor trametinib and other targeted therapies to delay emergence of resistance in response to RAS/MAPK pathway inhibition. We are also evaluating drug combinations targeting upstream and downstream nodes to shut down, or "clamp," the signaling of various oncogenic drivers such as RTKs, NF1, RAS, RAF, and MEK alterations, trapped between the inhibited nodes. With our MAPKlamp approach, we hope to induce tumor regression in RAS/MAPK pathway-driven cancers, while also blocking the in-pathway escape routes that lead to tumor resistance.

2. ***Target RAS, the midstream MAPK pathway node, directly with single agents and combinations.*** We are discovering and developing molecules that have the potential to inhibit RAS in its inactive GDP state (RAS-GDP) as well as its more prevalent active GTP state (RAS-GTP). Utilizing our in-house discovery efforts employing SBDD, we are developing proprietary compounds against KRAS mutations beyond G12C, such as pan-KRAS (ERAS-4).

3. ***Target escape routes enabled by other proteins or pathways to further disrupt RAS/MAPK pathway signaling.*** RAS-driven cancers utilize escape routes, namely cooperative mechanisms, to develop resistance to targeted therapies. By shutting down these potential escape routes, we aim to provide more robust inhibition of oncogenic signaling.

Our strategic focus on the RAS/MAPK pathway allows us to comprehensively target critical nodes in the pathway that could drive signaling. As shown in the figure below, our wholly-owned or controlled pipeline targets, either directly or indirectly, each of the signaling nodes colored in purple.



Our innovation model

Due to the magnitude of the challenge of erasing cancer, we are combining our robust internal discovery and development capabilities with a global in-licensing and acquisition strategy to assemble one of the industry's deepest, modality-agnostic RAS/MAPK pathway-focused pipeline. We believe these complementary approaches to innovation provide us with important optionality, both therapeutically and strategically, as we endeavor to bring forth the next generation of potentially differentiated targeted therapies for RAS/MAPK pathway-driven cancers.

Internal discovery and development

We have built a productive and efficient internal discovery engine at the heart of which lies SBDD, a key tool for the discovery of novel small molecule therapeutics and protein degraders. By elucidating the three-dimensional structure of the potential drug molecule or degrader bound to the target protein of interest, scientists can better understand and iterate on the structure-activity relationship of their hit and lead compounds or degraders.

We also use computational biology and computational chemistry to accelerate our discovery activities. We have standardized how we characterize our compounds across in vitro/vivo activity, drug distribution, metabolism, and PK, structural, and secondary pharmacology assays, and centralized the storage of these data for automated analyses. These data are continuously reviewed by our scientific teams, and promising trends, including unpredicted ones that arise serendipitously, are prioritized for future exploration.

We supplement our medicinal chemistry efforts with fragment screens and machine learning approaches. We are using DNA encoded library (DEL) screens to identify novel chemical matter with promising activity against targets of interest. These "hits" give us starting points for our early-stage drug discovery programs, and also provide opportunities to diversify molecular designs for later-stage discovery programs. DEL screens interrogate the binding of billions of compounds against our targets and increase the likelihood that we will discover a fragment that we can eventually transform into a potent therapy. We also sift through our integrated drug discovery data sets using machine learning algorithms to identify meaningful patterns that help inform next steps for our discovery projects. These analyses are conducted internally and through external collaborations, including ones that specialize in artificial intelligence.

Based on our previous collective experiences at Ignyta, Roche/Genentech, Pfizer, and elsewhere, our team has extensive precision oncology expertise with dynamic clinical trial designs such as adaptive trials, biomarker-based basket and umbrella studies, and master protocols. We will continue to leverage this experience, in collaboration with industry and academic partners, in order to quickly demonstrate clinical proof-of-concept in a variety of tumor types for both single agent and combination approaches.

External sources of innovation

We believe innovation in cancer therapy is a collective, global endeavor unlikely to emerge from a single company or a single platform. There are exciting product candidates, technologies, and approaches in development worldwide, and our innovation model gives us the flexibility to supplement our internal efforts with externally sourced assets through collaboration, in-license, or acquisition. We also established Erasca Ventures, our wholly-owned subsidiary, in March 2021 to make equity investments in early-stage biotechnology companies that are aligned with our mission and strategy. In March 2022, Erasca Ventures made an equity investment in Affini-T Therapeutics, Inc. (Affini-T), which is developing potential best-in-class T-cell receptor (TCR) cell therapies targeting multiple oncogenic driver mutations, including KRAS G12V and KRAS G12D. To date, we have in-licensed or acquired novel therapies from multiple geographic regions, including our lead program, naporafenib, which we in-licensed from Novartis, and our oral ERK1/2 inhibitor, ERAS-007, which we in-licensed from Asana.

We leverage our extensive network of preferred relationships with our Scientific Advisory Board and our Research, Development, and Commercial Advisory Board, as well as leading institutional investors, investment banks, academic institutions, and biopharmaceutical companies that keep us apprised of assets of strategic interest. We pursue the best science in the world, regardless of its origin, and will continue to opportunistically evaluate additional opportunities to strengthen and diversify our pipeline through academic and biopharmaceutical collaborations, in-licenses, acquisitions, and strategic investments that meet our high scientific bar and can help us advance our mission to erase cancer.

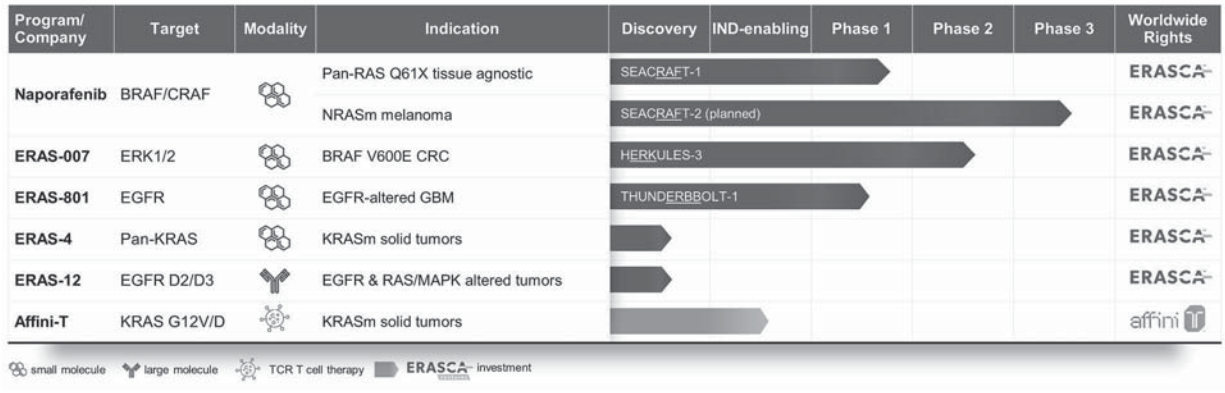
Modality-agnostic pipeline

Cancer is a complex, heterogeneous disease that is unlikely to succumb to a one-size-fits-all approach. We believe shutting down the RAS/MAPK pathway in cancer requires a systematic, data-driven approach to development, part of which involves choosing the most appropriate technology for the target of interest, or what we call a modality-agnostic approach. We therefore seek to understand the biology of the target of interest first, and then choose the therapeutic modality best suited to optimally inhibit that target. We are currently utilizing several modalities to target the RAS/MAPK pathway, including small molecule therapeutics and large molecule therapeutics.

For example, we are developing proprietary bispecific antibodies that are designed to bind EGFR in both the active and inactive conformations, potentially leading to deeper inhibition of EGFR-mediated RAS/MAPK pathway signaling. In addition to inhibiting EGFR signaling, our bispecific antibodies are designed to induce higher orders of EGFR receptor clustering on the cell surface, which may induce anti-tumor activity mediated by the immune system, such as antibody-dependent cellular cytotoxicity, antibody-dependent cellular phagocytosis, and/or complement-dependent cytotoxicity. We believe these design attributes can potentially enable our proprietary bispecific anti-EGFR antibodies to achieve meaningfully improved activity relative to currently approved anti-EGFR antibodies, such as cetuximab, panitumumab, and amivantamab, since those antibodies preferentially bind EGFR only in the inactive state and may not as strongly elicit anti-tumor immunological responses.

Our pipeline

We have assembled one of the deepest, wholly-owned or controlled RAS/MAPK pathway-focused pipelines in the industry, consisting of modality-agnostic programs aligned with our three therapeutic strategies of: (1) targeting key upstream and downstream signaling nodes in the RAS/MAPK pathway; (2) targeting RAS directly; and (3) targeting escape routes that emerge in response to treatment. The table below summarizes our current pipeline. We have exclusive worldwide development and commercial rights for all of our programs (excluding programs in our pipeline that arise from an investment made by Erasca Ventures in a third party).



Naporafenib: our pan-RAF inhibitor

Our lead product candidate is naporafenib, for which we plan to initiate a pivotal Phase 3 trial in the first half of 2024 for patients with NRASm melanoma. We dosed the first patient in a Phase 1b trial in August 2023 for patients with RAS Q16X solid tumors to inform additional clinical development pathways for naporafenib. Naporafenib is a pan-RAF inhibitor with first-in-class and best-in-class potential for patients with NRASm melanoma, RAS Q61X solid tumors, and other RAS/MAPK pathway-driven tumors. In-licensed from Novartis, naporafenib has been dosed in over 500 patients to date, whereby safety, tolerability, PK, and PD have been established in both monotherapy and select combinations, with clinical PoC data in combination with trametinib for patients with NRASm melanoma, which includes NRAS Q61X melanoma, and preliminary clinical PoC data in combination with trametinib for patients with RAS Q61X NSCLC.

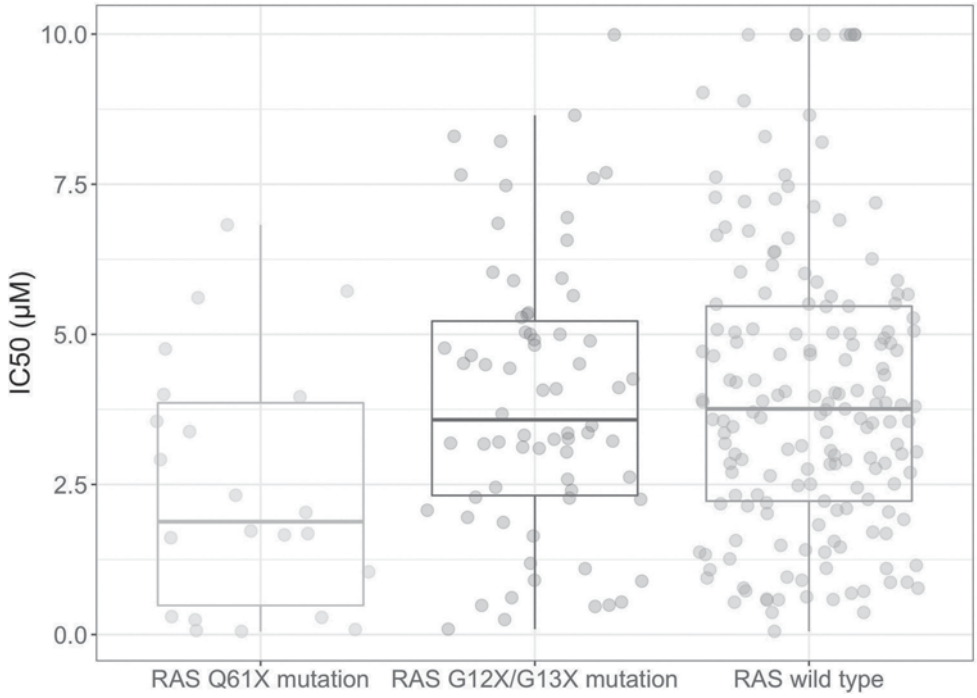
We are pursuing a broad development strategy for naporafenib, which includes our SEACRAFT trials designed to evaluate naporafenib's development opportunities in combination with other targeted therapies. We are prioritizing rapid development for naporafenib plus trametinib in the Phase 1b SEACRAFT-1 trial for patients with RAS Q61X solid tumors, which dosed its first patient in August 2023, and in the planned Phase 3 SEACRAFT-2 trial for patients with NRASm melanoma. SEACRAFT-1 is supported by clinical PoC data in patients with NRAS Q61X melanoma and preliminary clinical PoC data in patients with KRAS Q61X NSCLC. SEACRAFT-2 is supported by clinical PoC data in patients with NRASm melanoma, as presented by Novartis at the ESMO Congress 2022 medical conference and as published in March 2023 by de Braud et al. in the *Journal of Clinical Oncology*.

Preclinical profile of naporafenib

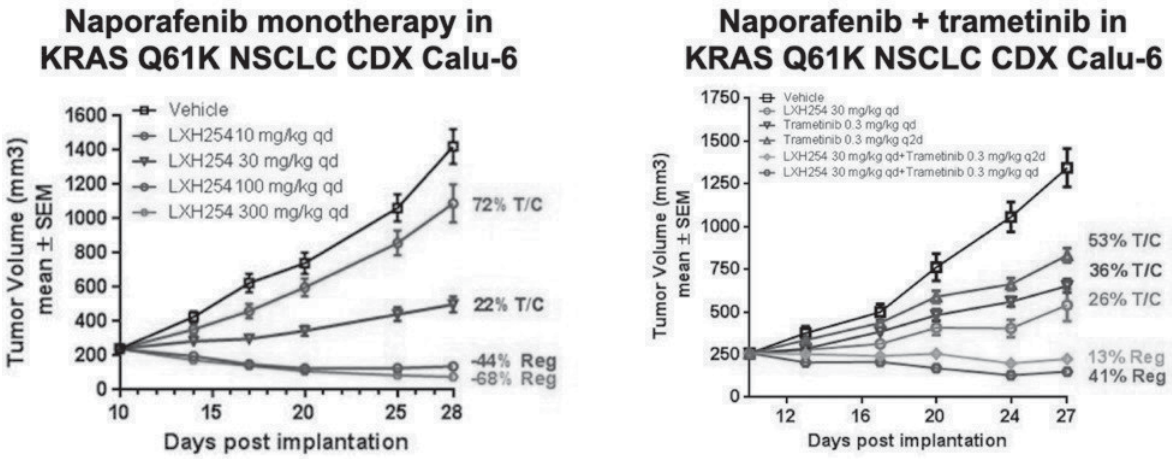
Naporafenib is designed to be a reversible, potent and selective ATP-competitive type 2 pan-RAF kinase inhibitor. It has been shown to be most potent against BRAF and CRAF with biochemical IC50 values of 0.1 and 0.2 nM, respectively, but also showed biochemical activity against ARAF with an IC50 of 6.4 nM. Naporafenib is designed to be selective for RAF family kinases, biochemically inhibiting only three non-RAF kinases at >80% at 1 μM (i.e., PDGFRB, DDR1, and DDR2).

As a pan-RAF inhibitor, naporafenib is differentiated from BRAF V600E inhibitors since naporafenib inhibits both RAF monomers and dimers. BRAF V600E inhibitors inhibit monomeric BRAF V600E proteins while simultaneously enabling dimerization of these inhibited monomers with uninhibited RAF proteins, thereby resulting in paradoxical activation of downstream RAS/MAPK pathway signaling. Naporafenib's ability to inhibit both RAF monomers and dimers enables it to effectively inhibit RAS mutants from signaling downstream without the paradoxical activation observed with BRAF V600E inhibitors.

In the KRAS Q61K-mutated NSCLC cell line Calu-6, naporafenib inhibited downstream MEK phosphorylation with an IC50 value of 14 nM after a two-hour treatment. In a 265-cell line panel, naporafenib tended to show the strongest activity against RAS Q61X-mutated cell lines relative to RAS G12X/G13X mutant and RAS WT cell lines. Naporafenib showed monotherapy activity in vivo in the KRAS Q61K-mutated NSCLC cell line-derived xenograft (CDX) model, Calu-6, achieving tumor regressions at orally administered doses of 100 mg/kg QD and 300 mg/kg QD. Naporafenib plus trametinib showed combination benefit in the Calu-6 CDX model, achieving tumor regression as a combination while the respective monotherapy treatments only achieved moderate tumor growth inhibition (i.e., a tumor growth inhibition ratio (T/C) ≥26%). Naporafenib and trametinib are ideal combination partners since they target two vertically adjacent nodes in the RAS/MAPK pathway, RAF and MEK, and both stabilize their targeted proteins in the inactive state; naporafenib in an ATP-competitive manner and trametinib in an allosteric manner.

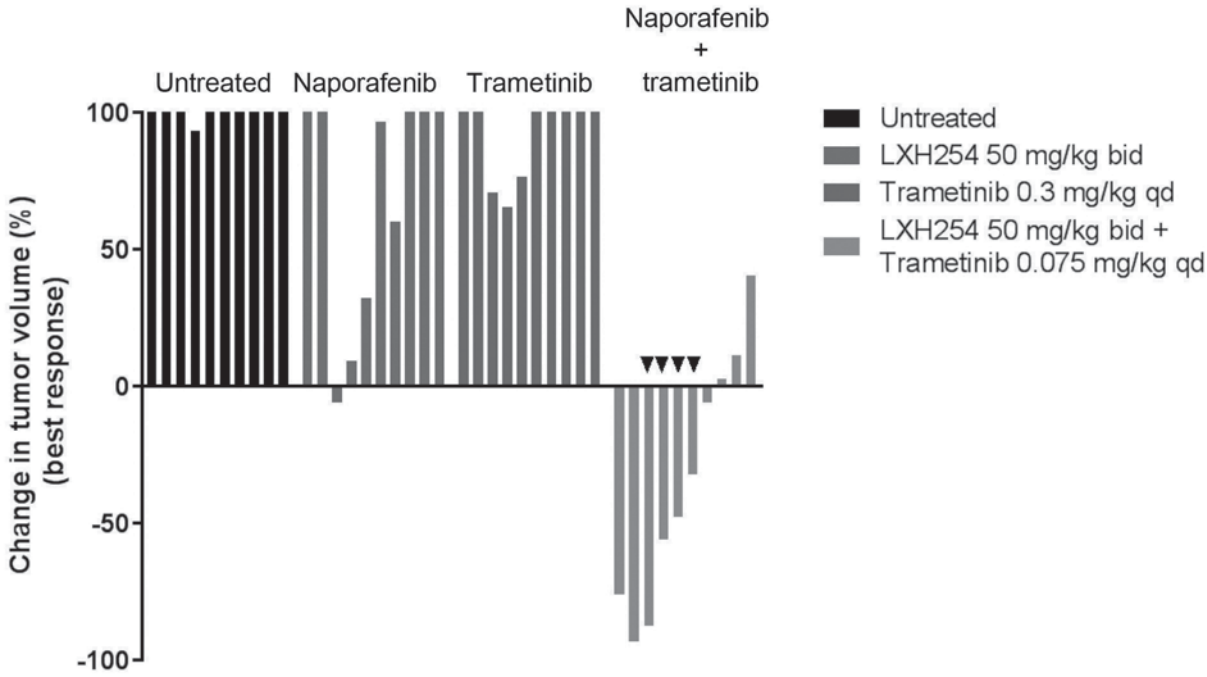


Naporafenib tended to show strongest in vitro activity against cell lines that harbor RAS Q61X mutations relative to RAS G12X/G13X mutations or are RAS wildtype. Stronger activity denoted by lower IC50 values. IC50 values were measured by CellTiter-Glo Luminescent Cell Viability Assay after 72-120 hour incubation with naporafenib. IC50 values were normalized to DMSO control.



In vivo activity of naporafenib (LXH254) monotherapy (left) and naporafenib plus trametinib (right) in the KRAS Q61K-mutated NSCLC CDX model Calu-6. Naporafenib was orally administered daily in both studies and trametinib was orally administered either daily or every other day. T/C percentages indicate the average size of the treatment group relative to vehicle on last treatment day. Smaller T/C values indicate better activity. Regression is measured by the change in average tumor size in the treatment group relative to the change in average tumor size in the vehicle group.

The naporafenib and trametinib combination achieved tumor regression in 60% of patient-derived NRAS Q61X-mutated melanoma models (n=10 total). Demonstrating in vivo synergy, regressions were only observed in the combination and not in either monotherapy treatment group.



The activity of LXH254 monotherapy, trametinib monotherapy, and the naporafenib and trametinib combination were characterized across 10 NRASm melanoma models. Each bar represents a patient-derived xenograft (PDX) model. The best response change in tumor volume was selected as the minimum observed change in tumor volume observed after treatment day 10. Each treatment group consisted of 3-5 mice. Tumor volume change measured the average tumor size at end of treatment relative to average tumor size at initiation of treatment. Arrowheads indicate models that were treated with a reduced dose of trametinib at 0.0375 mg/kg QD. Tumor regression classification required a best response tumor volume change of ≤ -30%.

Novartis' clinical development of naporafenib

Over 500 patients to date have been dosed with naporafenib either as monotherapy or in combination with other anti-cancer agents (investigational or approved). These agents include trametinib (MEK inhibitor), LTT462 (rineterkib; ERK inhibitor), dabrafenib (BRAF V600E inhibitor), ribociclib (CDK4/6 inhibitor), EGF816 (EGFR inhibitor), and spartalizumab (anti-PD-1). The safety, tolerability, PK, and PD have been established in both monotherapy and select combinations. Specifically, the doublet combinations of naporafenib with trametinib, rineterkib (LTT462), and ribociclib have been evaluated in both Phase 1b dose finding and Phase 2 clinical trials, and PoC has been achieved for the combination of naporafenib and trametinib in patients with NRASm melanoma, which includes NRAS Q61X melanoma, and preliminary clinical PoC has been achieved for that same combination in patients with RAS Q61X NSCLC.

Our initial development strategy will focus on the naporafenib combination with trametinib in these patient populations (e.g., NRASm melanoma) as well as expanded versions of these patient populations (e.g., RAS Q61X-mutated solid tumors), which represent high unmet medical needs without approved targeted therapy options. We will also continue to evaluate clinical activity with other combinations in biomarker-defined populations. Our ultimate goal is to maximize the clinical benefit of naporafenib in the greatest number of patients with cancer.

Eight clinical trials conducted by Novartis investigating naporafenib either as monotherapy or combination therapy are completed or ongoing:

- CLXH254X2101 is a first-in-human trial of naporafenib as single agent and in combination with spartalizumab.
- CLXH254X2102 is a Phase 1b trial of naporafenib in combination with rineterkib (LTT462), or with trametinib, or with ribociclib.
- CEGF816X2102 is a Phase 1b trial of EGF816 in combination with selected targeted agents, including naporafenib.
- CLXH254C12201 is a Phase 2 trial of naporafenib in combination with rineterkib (LTT462), or with trametinib, or with ribociclib.
- CADPT01C12101 is a Phase 1b trial of select drug combinations, including rineterkib (LTT462) and the selective BRAF kinase inhibitor dabrafenib in combination with naporafenib.
- CPDR001X2X01B is an open-label, multi-center rollover protocol for continued characterization of safety and tolerability for patients who have participated in a Novartis-sponsored spartalizumab trial as single agent or in combination with other treatments.
- CLXH254A02101 is a Phase 1, randomized, open-label, three period, crossover trial to evaluate the relative bioavailability of three naporafenib formulations in healthy volunteers.
- CLXH254C12106 is a Phase 1, randomized, open-label, three period, crossover trial to investigate the effect of food and the effect of the proton-pump inhibitor, rabeprazole on the pharmacokinetics of a single oral dose of naporafenib in healthy volunteers.

Clinical safety and tolerability

Monotherapy. A total of 87 patients were enrolled in the monotherapy dose escalation portion of the first-in-human trial (CLXH244X2101) of naporafenib in patients whose tumors had MAPK pathway alterations and progression following standard-of-care (SOC) treatment. 43 patients in total were enrolled in six QD dosing cohorts (range 100 mg to 1200 mg QD) and 44 patients in total were enrolled in four BID dosing cohorts (200 mg to 800 mg BID). An MTD was not identified for the QD schedule while the MTD/recommended dose for expansion (RDE) for the BID schedule was determined to be 600 mg twice a day (BID). The monotherapy dose expansion portion of the trial was not opened in order to focus on combination development. During naporafenib monotherapy dose escalation, five patients experienced 7 dose-limiting toxicities: decreased platelet count (1200 mg QD); neuralgia, maculopapular rash, pruritus (600 mg BID); increased blood bilirubin, hyponatremia, peripheral sensory neuropathy (800 mg BID). For the single-agent cohort, treatment-related adverse events (TRAEs) of any grade were reported in 79 (90.8%) patients. The most frequent (occurring in ≥20% of patients) were dermatitis acneiform (maculopapular pustular eruptions) (24.1%, no Grade 3/4 events), rash (24.1%, Grade 3/4: 1.1%), and fatigue (20.7%, Grade 3/4: 2.3%).

Naporafenib plus trametinib. Two trials have evaluated the combination of naporafenib plus trametinib: the dose finding Phase 1b trial CLXH254X2102 and the Phase 2 trial CLXH254C12201.

The CLXH254X2102 trial enrolled patients who had advanced or metastatic KRAS or BRAF mutant NSCLC or NRASm melanoma with progression following SOC treatment. A total of 115 patients were treated with naporafenib plus trametinib in combination in 5 dose cohorts. Four cohorts received naporafenib and trametinib (doses are listed as naporafenib mg BID/trametinib mg QD): 200/0.5 (6 patients), 200/1 (54 patients), 400/0.5 (44 patients), 400/1 (5 patients), and a fifth cohort was administered 400 mg naporafenib BID continuously and trametinib 1 mg QD following a 2 weeks on/2 weeks off schedule (6 patients). Thirty-six patients in total were enrolled in dose escalation while 30 were enrolled in the NRASm melanoma expansion cohorts. During dose escalation, six patients reported 6 DLTs: dermatitis acneiform (one patient each in the 200/1 and 400/0.5 cohorts), maculopapular rash (one patient each in the 200/1 and 400/1 cohorts), increased lipase (one patient in the 200/1 cohort), and Stevens-Johnson syndrome (one patient in the 400/1 cohort). Two RDEs were identified: naporafenib 200 mg BID plus trametinib 1 mg QD and naporafenib 400 mg BID plus trametinib 0.5 mg QD. For the dose expansion portion of the trial, TRAEs of any grade were reported in 100% of patients. The most frequent (occurring in ≥20% of patients enrolled in dose expansion) TRAEs were rash (80.0%, Grade 3/4: 33.3%), nausea (30.0%, no Grade 3/4 events), diarrhea (30.0%, no Grade 3/4 events), blood creatinine phosphokinase increased (30.0%, Grade 3/4: 13.3%), constipation (23.0%, no Grade 3/4 events), stomatitis (20.0%, Grade 3/4: 3.3%) and vomiting (20.0%, no Grade 3/4 events).

The CLXH254C12201 trial enrolled patients with NRASm or BRAFm melanoma who have received prior systemic therapy for unresectable or metastatic melanoma with an anti-PD-1/L1-based regimen and were restricted to a maximum of two prior lines of systemic immune checkpoint inhibitor (ICI)-containing immunotherapy for unresectable or metastatic melanoma. The combination of naporafenib plus trametinib was evaluated at the RDEs of 200/1 (30 patients) and 400/0.5 (22 patients) where both naporafenib plus trametinib were administered continuously BID and QD, respectively. The most frequent (occurring in ≥20% of patients) TRAEs were rash (39.6%, Grade 3/4: 9.4%), dermatitis acneiform (34.0%, Grade 3/4: 7.5%), pruritis (26.4%, Grade 3/4: 1.9%), blood creatinine phosphokinase increased (20.8%, Grade 3/4:1.9%), and fatigue (20.8%, Grade 3/4: 1.9%).

Other combination data from ongoing Novartis trials. The trials referenced above were initiated by Novartis prior to the effective date of our license agreement with Novartis, and we will coordinate with Novartis in connection with the public release of data from these trials.

Summary. Naporafenib administered as monotherapy has been generally well tolerated when administered using either a QD or BID schedule. When combined with trametinib, the frequency and severity of AEs increased, as would be expected for a combination versus monotherapy. The most common toxicities observed for the naporafenib plus trametinib combination were related to skin findings, all of which were consistent with those observed with trametinib monotherapy or other trametinib combinations. While skin toxicity (manifesting as rash and dermatitis acneiform) was a common TRAE, we believe mandatory primary prophylaxis for rash could reduce both the frequency and severity of these events, thereby increasing the potential for improvement in long-term tolerability and increased efficacy. This approach has been implemented for SEACRAFT-1 and will be implemented in SEACRAFT-2. In addition, the fact that naporafenib monotherapy has been generally well tolerated, coupled with the observation that it has been administered with multiple other therapies with a variety of mechanisms of action (e.g., trametinib, LTT462, spartalizumab) without clinically relevant drug-drug interactions suggest that naporafenib may be an optimal partner for combination approaches.

Clinical Pharmacology

Monotherapy naporafenib showed a relatively rapid absorption with a median time to reach peak plasma concentration (Tmax) ranging from approximately 2 to 4 hours. Similar median Tmax ranges were observed when naporafenib was administered in combination with trametinib, LTT462, and ribociclib. The effective half-life is approximately 20-25 hours. The clinical exposure was approximately dose proportional across the dose range tested between 100 mg and 1200 mg QD as well as 200 mg and 600 mg BID. No significant drug-drug interactions have been observed between naporafenib and trametinib, LTT462, or ribociclib in the dose ranges tested. Other clinical pharmacology studies are ongoing.

Clinical Efficacy

Monotherapy. In the first-in-human dose escalation trial CLXH254X2101, two patients achieved confirmed partial responses (PRs): a patient with KRAS G12V-mutated ovarian cancer was treated with naporafenib 300 mg QD, and a patient with HRAS G13R-mutated head and neck cancer was treated with naporafenib 400 mg QD.

Naporafenib plus trametinib. A total of 71 patients with NRASm melanoma were dosed with the combination of naporafenib and trametinib at two different doses across two different trials (Phase 1b CLXH254X2102 and Phase 2 CLXH254C12201) in the post immuno-oncology (IO) setting. A pooled analysis across these trials showed a 31% confirmed overall response rate (ORR) for the 39 patients who received naporafenib 200 mg BID and trametinib 1 mg QD (200/1; one of the two RDEs) and a 22% confirmed ORR for the 32 patients who received naporafenib 400 mg BID and trametinib 0.5 mg QD (400/0.5; the other RDE). The duration of response (DOR) for the 200/1 pooled dataset was 7.4 months, the median progression-free survival (mPFS) was 5.1 months, and the median overall survival (mOS) was 13.0 months. The DOR for the 400/0.5 pooled dataset was 10.2 months, the mPFS was 4.9 months, and the mOS was 14.1 months. Both the mPFS and mOS for the pooled dataset at each dose were longer than their comparable benchmarks.

For both ORR and PFS, we believe the most robust benchmark is the randomized Phase 3 NEMO trial, which was a randomized Phase 3 trial evaluating binimetinib versus dacarbazine in NRAS melanoma. Since both ORR and PFS directly measure the activity of trial treatments, we believe the data in this trial are generalizable to the patient population enrolled in both Novartis' Phase 1b and Phase 2 trials referenced above, despite the NEMO trial primarily enrolling treatment-naïve patients (~80%). In contrast to ORR and PFS, the OS results observed for the Phase 3 NEMO trial reflect not only the trial treatments (dacarbazine or binimetinib) but also the therapies received by patients after discontinuing the trial treatment. More specifically, since (i) ~45% of patients in either arm of the NEMO trial were reported to have received IO-based therapy after dacarbazine or binimetinib and (ii) IO-based therapy prolongs overall survival compared to other therapies available at that time, the mOS as measured by a Kaplan-Meier analysis would be predicted to overestimate the OS benefit provided by either dacarbazine or binimetinib without the IO-based therapy. In contrast, in the two naporafenib plus trametinib studies, all patients received IO-based therapy prior to enrollment, and since OS in clinical trials is measured from when a patient enters the trial, we believe that the results in NEMO likely overestimate the mOS values compared to the two naporafenib plus trametinib studies. In addition, while we believe that the mOS results from NEMO likely overestimate the potential OS benefit from dacarbazine or binimetinib, the mOS from the naporafenib plus trametinib combination is still quantitatively longer than that observed in either arm in the NEMO trial.

Since no randomized trials have been completed for patients with NRASm melanoma in the post-IO setting, other potential OS benchmarks available for comparison to the results from the pooled naporafenib plus trametinib analysis are either from published literature describing retrospective chart reviews of comparable patient populations or from data generated in similar patient populations enrolled in either the Phase 1b or Phase 2 trials themselves. In four publications describing retrospective chart reviews in patients with melanoma receiving either cytotoxic chemotherapy or MEK inhibitor monotherapy in the post-IO setting, the mOS was approximately 7 months. Similarly, for patients with BRAF/MEK-inhibitor resistant BRAFm melanoma enrolled in the Phase 2 trial and treated with naporafenib plus trametinib, which did not induce responses in this particular patient population, the mOS was approximately 7 months. We believe that the consistency of the mOS values for both the retrospective chart reviews and BRAF/MEK-inhibitor resistant BRAFm melanoma patients in the Phase 2 trial suggest that for patients with melanoma being treated in the post-IO setting, the natural history of their disease is represented by a mOS of approximately 7 months. In contrast, the mOS observed for patients with NRASm melanoma treated with naporafenib plus trametinib was approximately 13 to 14 months. This near doubling of OS demonstrated by naporafenib plus trametinib compares favorably relative to the historical benchmarks described above.

	MEKi		SOC	Pooled Ph 1 and Ph 2[4]	
	Binimetinib[1]	Trametinib[2]	Chemo[3]	Naporafenib + Trametinib	
	45mg	2mg	1g/m² IV	200mg+1mg	400mg+0.5mg
	N=269	N=33	N=133	N=39	N=32
ORR n (%)	41 (15%)	5 (15%)	9 (7%)	12 (31%)	7 (22%)
DCR n (%)	157 (58%)	N/A	33 (25%)	28 (72%)	21 (66%)
mDOR months	6.9	*~6.9**	NE	7.4	10.2
mPFS months	2.8	*~2.8**	1.5	**5.1**	**4.9**
mOS months	~10-11 months (Benchmark #1: *NEMO Study*)			**~13 months**	**~14 months**
	~7 months (Benchmark #2: Chart Review)				
	~7 months *(Benchmark #3: C12201 BRAFm Patients)*				

*Assumes trametinib efficacy is similar to published binimetinib efficacy results

1 Dummer et al 2017; binimetinib is administered BID
2 Pooled analysis from the following publications: Falchook et al, 2012; Pigne et al, 2023; Salzmann et al, 2022; trametinib is administered QD
3 Dacarbazine is the approved chemotherapy in this indication
4 Ph 1 = CLXH254X2102 with DCO 4 Aug 2022; Ph 2 = CLXH254C12201 with DCO 30 Dec 2022 The melanoma patients in CLXH254X2102 (Phase 1b) included patients who had received between 2 to 7 lines of prior therapies. CLXH254C12201 (Phase 2) enrolled 2nd or 3rd line patients who were post-IO therapy.
PFS includes both responders and non-responders
SOC: standard of care; N/A: not available; NE: not estimable; DCO: data cutoff; DCR: disease control rate; mDOR: median duration of response; ORR: objective response rate; mPFS: median progression free survival
The pooled phase 1 and phase 2 napo + tram data covers two clinical trials with different designs and inclusion criteria, which cannot be directly compared, and therefore may not be a reliable indicator of efficacy data
Due to differences between trial designs and subject characteristics, comparing data across different trials may not be a reliable indicator of the data

In summary, naporafenib plus trametinib demonstrated anti-tumor activity in patients with NRASm melanoma in a pooled analysis from two trials (Phase 1b: CLXH254X2102 and Phase 2: CLXH254C12201), and across two different dose levels of naporafenib and trametinib.

Summary. We believe clinical PoC in patients with NRASm melanoma, which includes Q61X melanoma, and preliminary PoC for patients with RAS Q61X NSCLC have been established for the combination of naporafenib and trametinib, which is designed to inhibit MEK, a downstream node of the RAS/MAPK pathway. Although clinical trial data across separate trials may not be directly comparable due to differences in trial protocols, conditions and patient populations, these data compare favorably with the clinical activity observed with the standard of care agents used to treat patients with NRASm melanoma who have progressed on immunotherapy.

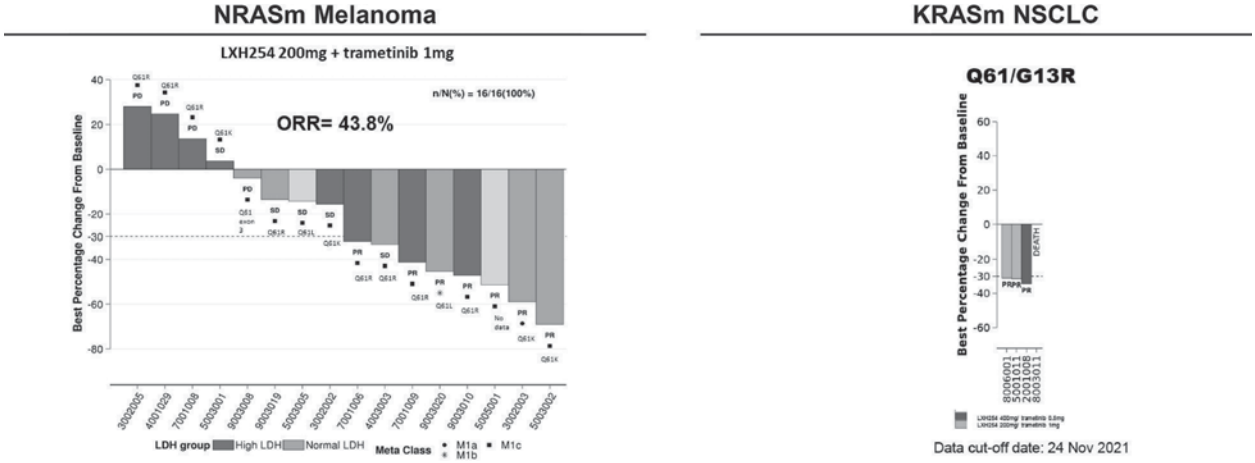
Development strategy for naporafenib

Naporafenib's clinical development plan is centered on the quick and efficient capitalization on the clinical PoC established in patients with NRASm melanoma (which includes NRAS Q61X melanoma) and the preliminary clinical PoC established in patients with RAS Q61X NSCLC. In December 2023, we announced that the FDA granted FTD to naporafenib in combination with trametinib for the treatment of adult patients with unresectable or metastatic melanoma who have progressed on, or are intolerant to, an anti-programmed death-1 (ligand 1) (PD-(L)1)-based regimen, and whose tumors contain an NRAS mutation (NRASm).

NRAS-mutated melanoma. NRASm melanoma accounts for approximately 69,000 newly diagnosed patients worldwide. The frontline standard of care for patients with NRASm melanoma is an anti-PD-1/L-1-based regimen (immunotherapy) where the PD-1/L-1 inhibitor is administered as monotherapy or in combination. The highest unmet need in this population is in the post-IO setting, where there is no single global regulatory or accepted SOC. Rather, an analysis of regulatory approvals of drugs for patients with melanoma, published treatment guidelines, and the feedback from an advisory board attended by treating physicians in North America, Europe, and Australia indicate that the treatment choices for this post-IO patient population include cytotoxic chemotherapy (e.g., dacarbazine, temozolomide, etc.), single agent MEK inhibitors (e.g., trametinib, binimetinib, cobimetinib), and clinical trials. In addition, there is no clear preference for what type of chemotherapy or MEK inhibitor should be administered. The best reference data for chemotherapy in patients with NRASm melanoma are from the NEMO trial. The patient composition is 82% treatment-naïve, 16% 2nd line, 2% 3rd line or more. The major strength of these reference data is this is the largest and most recent phase 3 dataset in which all patients had NRASm melanoma and are relatively homogeneous, with the vast majority being treatment-naïve. The major

weakness is that only 21% of patients had received prior IO therapy. In the NEMO trial, the ORR for chemotherapy was 7%, the mPFS was only 1.5 months, and mOS was 10.1 months. Furthermore, the NEMO trial showed that the MEK inhibitor binimetinib had an ORR of 15%, a mPFS of 2.8 months, and a mOS of 11.0 months. A cross-trial comparison suggests that the combination of pan-RAF inhibitor plus MEK inhibitor may be superior to MEK inhibition alone or standard of care chemotherapy. We plan to test this hypothesis in a randomized controlled trial in the post-IO setting for potential registration (SEACRAFT-2).

RAS Q61X solid tumors. Patients with NRASm tumors represent approximately 399,000 newly diagnosed patients worldwide. Work in nonclinical models suggests that RAS Q61X and RAS G13R mutations are particularly sensitive to pan-RAF inhibition due to a dependency on CRAF for downstream RAS/MAPK pathway signaling. Early confirmation of this hypothesis has been seen in patients with NRASm melanoma, where 80-90% of patients have NRAS Q61X mutations. In CLXH254X2102 (Phase 1b trial), a confirmed ORR of 44% was observed in 16 patients with NRAS melanoma, with 15 of these patients with documented Q61X mutations. (See left figure below.) To test this hypothesis in other tumor types, naporafenib plus trametinib was evaluated in 49 patients with KRAS-mutated NSCLC, including 4 patients with tumors harboring KRAS Q61X or G13R mutations. Objective responses were observed in 3 out of the 4 patients. (See right figure below.) Remarkably, 2 out of the 3 patients with KRAS Q61-mutated tumors had confirmed PRs, and the 3rd responder had a KRAS G13R-mutated tumor with an unconfirmed PR. In contrast, only 1 out of 45 patients without KRAS Q61X or G13R mutation responded. Based on these early signals, another development path for naporafenib plus trametinib is to pursue a tissue agnostic indication in patients with solid tumors with RAS Q61X mutations. We are testing this hypothesis in an ongoing Phase 1b trial (SEACRAFT-1).



Clinical development plan for naporafenib

Naporafenib is our most advanced clinical-stage program. We believe it has the potential to change the standard of care in a number of indications with high unmet medical need, including in patients with NRASm melanoma, as well as patients with RAS Q61X solid tumors.

SEACRAFT-1. The SEACRAFT-1 trial is a Phase 1b trial to establish the PoC for the tissue-agnostic hypothesis in patients with RAS Q61X solid tumors. In addition to NRAS Q61X melanoma and KRAS Q61X NSCLC, the trial is enrolling patients with other solid tumors that harbor any RAS Q61X mutation, who have either progressed on, or are intolerant, to standard of care treatment, or for whom no standard of care exists. If PoC is established by demonstrating anti-tumor activity across a broad range of tumor types, we plan to discuss with regulatory authorities a potential fast-to-market strategy in an indication where no approved standard of care exists, to address high unmet medical need. We dosed the first patient in the SEACRAFT-1 trial in August 2023. We anticipate a Phase 1b combination data readout from SEACRAFT-1 between the second and fourth quarters of 2024.

SEACRAFT-2. The SEACRAFT-2 trial will formally test the hypothesis supported by the clinical PoC data in patients with NRASm melanoma. We plan to enroll NRASm melanoma patients who have progressed on, or are intolerant to, SOC ICI therapy into a potentially registration-enabling randomized Phase 3 trial in which patients will receive either naporafenib plus trametinib or physician's choice of therapy (dacarbazine, temozolomide, or trametinib monotherapy). We have designed the trial to demonstrate superiority in PFS and/or OS based on benchmarks from published literature. Important details of the trial design, such as the primary endpoints and choice of therapy in the physician's choice comparator arm, have been discussed with regulatory authorities. In addition, we have added a dose optimization stage to the trial

design that will enable selection of the optimal naporafenib plus trametinib dosing regimen that will then be incorporated into the potentially registration-enabling portion of the trial. We expect to initiate the SEACRAFT-2 trial in the first half of 2024 and have Phase 3 Stage 1 randomized dose optimization data in 2025.

In addition, we plan to introduce proactive safety management, including mandatory primary rash prophylaxis, and other elements that are designed to improve the safety and tolerability of this regimen for patients participating in our trials.

Other development opportunities. A strong motivation to add naporafenib to our precision oncology pipeline is the potential synergy of naporafenib with our other agents that target the RAS/MAPK pathway, including but not limited to ERAS-007. These combinations will allow us to evaluate a number of biomarker-defined patient populations for whom there are no approved targeted therapies. These may include other RAS/MAPK pathway mutations beyond those being studied by SEACRAFT-1 and SEACRAFT-2. These development opportunities may expand the potential impact of naporafenib to larger patient populations. We plan to explore these combinations and patient populations in a Phase 1b trial. We are conducting preclinical studies to assess the optimal indications to inform the clinical design and will then commence the trial once the design has been finalized.

ERAS-007: our ERK inhibitor

ERAS-007 is designed to be a potent and selective oral inhibitor of ERK1/2. We in-licensed ERAS-007 from Asana based in part on preclinical studies that demonstrated the highest potency and longest target residence time of any ERK inhibitors of which we are aware. In a Phase 1 clinical trial completed by Asana, ERAS-007 demonstrated single-agent activity including objective responses in patients with tumors harboring RAS/MAPK pathway alterations and was well tolerated. We are currently evaluating ERAS-007 in the HERKULES-3 clinical trial, for which we dosed the first patient in September 2021.

Preclinical profile of ERAS-007

ERAS-007 is a potent, reversible, and ATP-competitive inhibitor of ERK1 and ERK2 with a biochemical IC50 (a measure of 50% inhibition) against both ERK1 and ERK2 of 2 nM and cell-based mechanistic IC50 against pRSK of 7 nM. In the BRAF V600E CRC cell line RKO, ERAS-007 showed superior potency to a comparator ERKi, ulixertinib, and comparable potency to binimetinib, a MEK inhibitor. In addition, ERAS-007 exhibited long biochemical residence time while bound to ERK, which has been measured as 550 minutes against ERK2. This longer target residence time compared to other clinical-stage ERK inhibitors may allow for longer intervals between doses in patients.

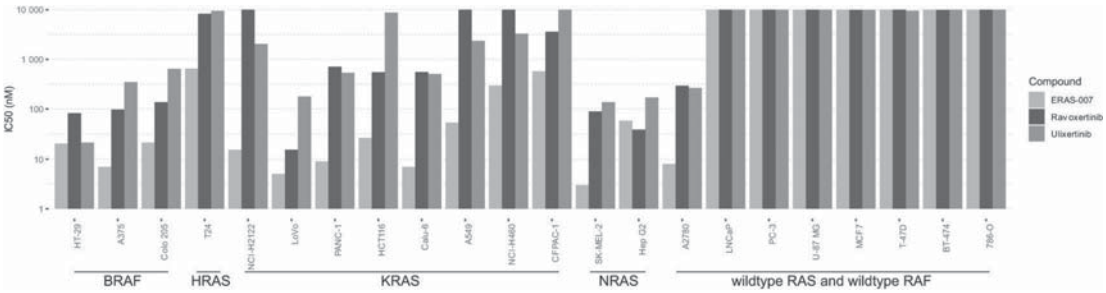
Assay Type	Assay	ERAS-007 IC50 (nM)
Biochemical	ERK1	2
	ERK2	2
Cell-based mechanistic (HT-29)	pRSK	7

ERAS-007 IC50s against ERK1 and ERK2 were characterized in a biochemical kinase activity. Cell-based IC50 was characterized by the ability of ERAS-007 to inhibit ERK from phosphorylating one of its downstream targets, RSK1. pRSK represents RSK1 phosphorylation.

Compound	ERK2 residence time (τ) (min)
ERAS-007	550
ulixertinib	16
trametinib	<0.03
binimetinib	<0.03

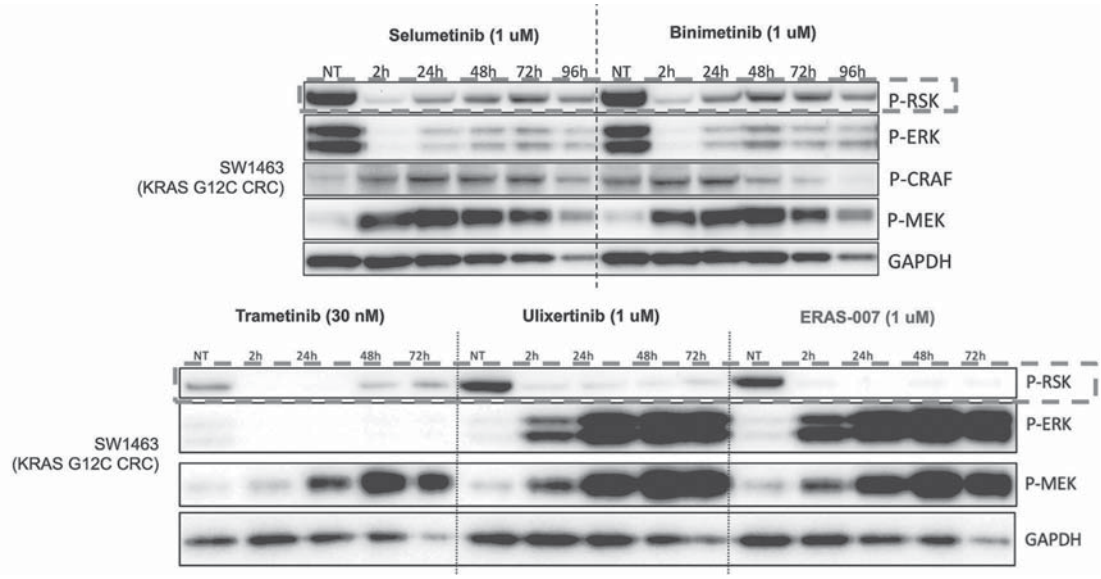
ERK2 residence time for ERKi(s), ERAS-007 and ulixertinib, and MEKi(s), trametinib and binimetinib, were determined by BLI and SPR, respectively.

This biochemical potency has translated into strong anti-proliferative activity in cell lines with mutations in the RAS/MAPK pathway compared to other clinical-stage ERK inhibitor compounds. In 14 out of 14 cell lines that harbored activating RAS/MAPK pathway alterations, ERAS-007 exhibited potent activity with a less than 1 μM IC50. In two KRAS G12C cell lines, ERAS-007 showed greater potency compared to ulixertinib, an ERK inhibitor, comparable potency to binimetinib, a MEK inhibitor, and sotorasib, a KRAS G12C inhibitor. Cellular signaling studies demonstrated that ERAS-007 inhibited phosphorylation of downstream targets of ERK such as ribosomal S6 kinases (RSK), Fos-related antigen (FRA), and ETS domain-containing protein (ELK) in the BRAF V600E CRC HT-29 cell line. Demonstrating its selectivity, in seven out of eight cell lines that did not harbor any activating RAS/MAPK pathway alterations, ERAS-007 showed weak inhibition with a greater than 10 μM IC50. Together, these results suggest that ERAS-007 is a potent and selective ERK inhibitor with the ability to inhibit cell growth in multiple models of RAS/MAPK pathway-driven cancers relative to other agents used in these settings.



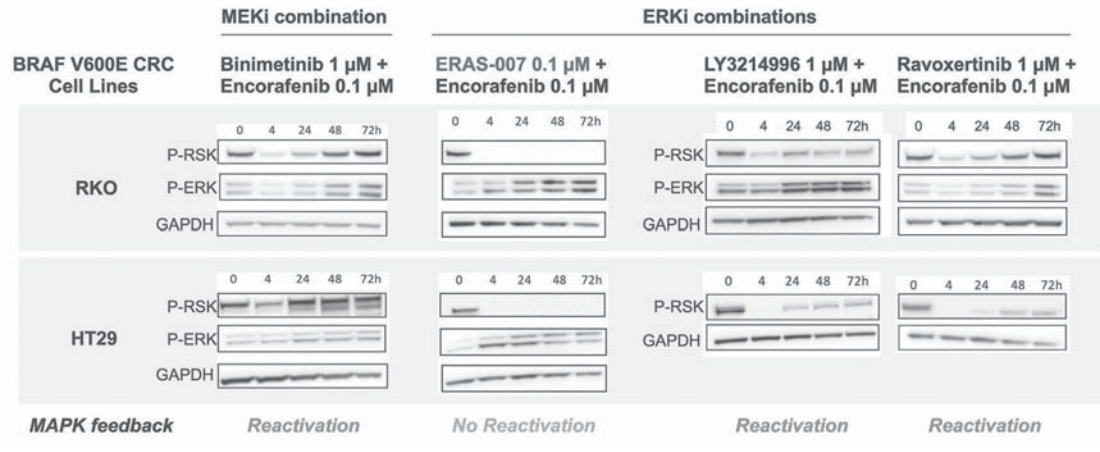
ERAS-007, ulixertinib and ravoxertinib were profiled in 3 BRAF mutant, 1 HRAS mutant, 8 KRAS mutant, 2 NRAS mutant, and 8 wildtype RAS and wildtype RAF cell lines. Nanomolar IC50 values are represented on the y-axis. Lower IC50s denote stronger activity.

Inhibition of signaling by kinases is typically achieved by either: (1) ATP-competitive inhibition whereby an inhibitor blocks ATP binding or (2) allosteric inhibition whereby an inhibitor does not block ATP binding but rather binds to a different region to prevent the kinase from signaling downstream. Currently approved MEK inhibitors, trametinib, binimetinib, selumetinib, and cobimetinib, are allosteric MEK inhibitors. A potential limitation of these allosteric MEK inhibitors is that they preferentially bind MEK in the inactive state and have weaker inhibitory activity against activated MEK proteins. Another limitation is that some MEK inhibitors preferentially disrupt activation via one RAF family member (e.g., BRAF) but not another (e.g., CRAF). Due to negative feedback regulation in the RAS/MAPK pathway, inhibition of downstream signaling nodes can result in RAS/MAPK pathway feedback reactivation that is mediated through multiple members of the RAF family. This increased upstream signaling pressure can serve as a resistance mechanism to MEK inhibitors and has been observed in the clinic. As an ATP-competitive ERK inhibitor, ERAS-007 has been shown to more robustly block RAS/MAPK pathway reactivation than allosteric MEK inhibitors. As shown in the figure below, ERAS-007 continuously inhibited downstream ERK activity in a KRAS G12C-mutated CRC cell line; whereas the RAS/MAPK pathway was reactivated beginning as early as 24 hours after treatment with each of the three MEK inhibitors, which is illustrated with the emergence of the dark P-RSK bands (darker intensity equates to higher signaling or reactivation) in the following Western blots.



Western blot characterization of three MEK inhibitors (selumetinib, binimetinib, and trametinib) and two ERK inhibitors (ulixertinib and ERAS-007) in the KRAS G12C-mutated CRC cell line SW1463. The phosphorylation states of RSK (P-RSK), ERK (P-ERK), CRAF (P-CRAF) and MEK (P-MEK) are shown. Band intensity indicates level of phosphorylation. Total GAPDH (GAPDH), a housekeeping gene, is used as a protein loading control. Times, in hours, represent the duration of compound incubation. NT means "no treatment," and this sample serves as a negative control. The level of P-RSK, highlighted in dotted red rectangles, indicates ERK signaling activity. The absence of a P-RSK band indicates inhibition of ERK signaling activity and thereby inhibition of RAS/MAPK pathway signaling.

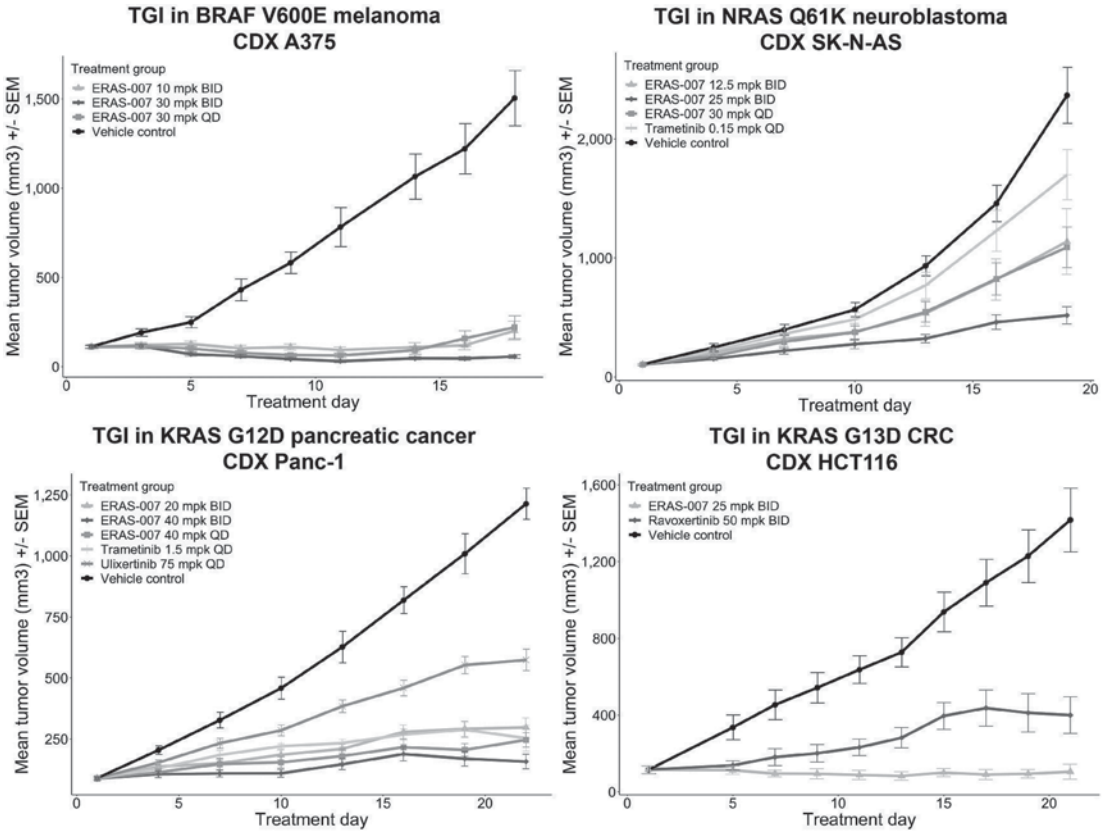
When combined with encorafenib in BRAF V600E-mutated cell lines, ERAS-007 blocked the RAS/MAPK pathway feedback reactivation that was observed with MEK or other ERK inhibitors at one-tenth the concentration. These results provide further support that inhibition of ERK by ERAS-007 may lead to more complete and durable blockade of the RAS/MAPK pathway relative to other inhibitors of ERK or MEK, either alone or in combination.



Treatment of two BRAF V600E-mutated CRC cell lines, RKO and HT-29, with encorafenib in combination with the MEK inhibitor binimetinib, the ERK inhibitor ERAS-007, the ERK inhibitor LY3214996, and the ERK inhibitor ravoxertinib. The Western blot gels depict phosphorylation of RSK (P-RSK) and ERK (P-ERK). Higher levels of phosphorylation are depicted by higher (i.e., darker) band intensity. Total GAPDH protein (GAPDH) serves as a loading control. ERK signaling activity is represented by the phosphorylation state of RSK (P-RSK), which is a downstream target of ERK. The column values indicate the duration of compound incubation of up to 72 hours.

Preclinical anti-tumor activity of ERAS-007

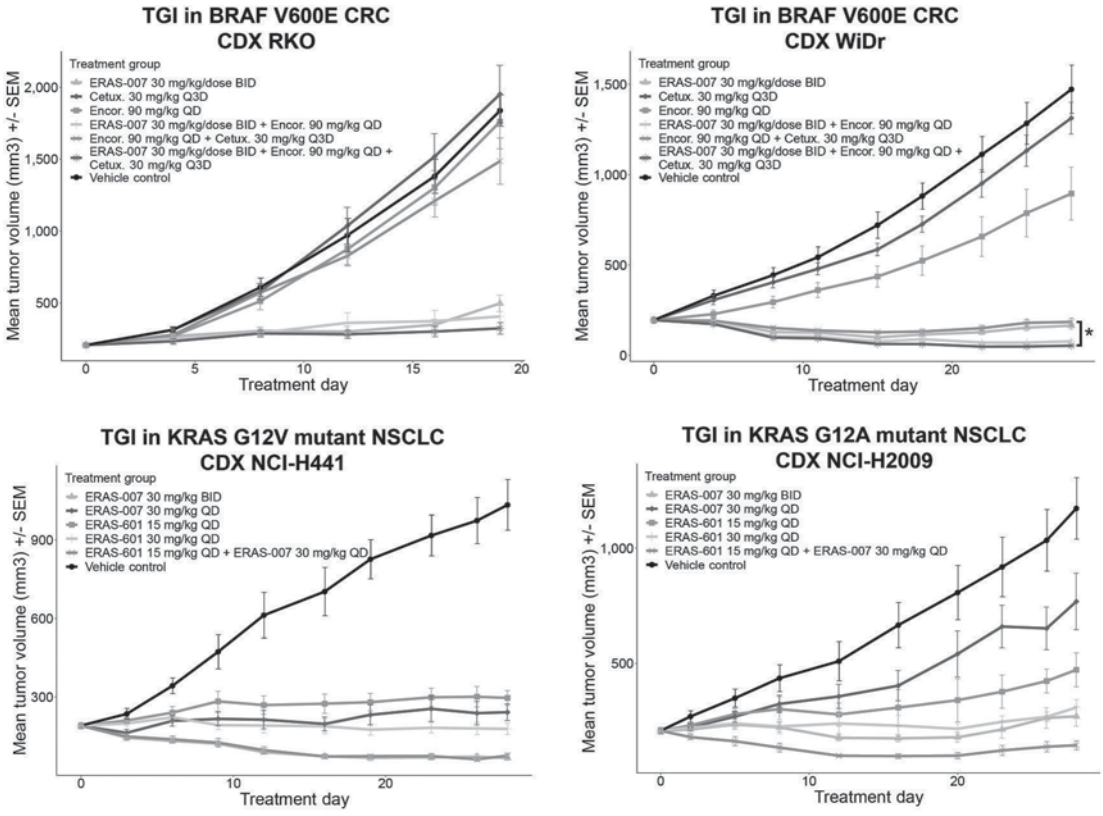
We further showed the breadth of ERAS-007 in vivo activity in CRC, pancreatic cancer, melanoma, and neuroblastoma models harboring alterations in the BRAF, NRAS, or KRAS nodes of the RAS/MAPK pathway. In the BRAF V600E-mutated melanoma CDX A375 model, ERAS-007 showed dose-dependent tumor inhibition with a maximal 104% tumor growth inhibition (TGI) at 30 mg/kg BID (p-value < 0.001 across all ERAS-007 doses relative to vehicle control). In the NRAS Q61K-mutated neuroblastoma CDX SK-N-AS model, ERAS-007 showed dose-dependent tumor inhibition with a maximal 82% TGI at 25 mg/kg BID (p-value < 0.001 across all ERAS-007 doses relative to vehicle control). In the KRAS G12D pancreatic CDX Panc-1 model, ERAS-007 showed dose-dependent TGI with a maximal 94% TGI at 40 mg/kg BID (p-value < 0.001 across all ERAS-007 doses relative to vehicle control). In the KRAS G13D CRC CDX HCT116 model, ERAS-007 showed 101% TGI at 25 mg/kg BID (p-value < 0.001 relative to vehicle control). ERAS-007 showed superior TGI to ulixertinib at 75 mg/kg QD in Panc-1 at doses ranging from 20 mg/kg BID to 40 mg/kg BID. TGI values >100% indicated tumor regression.



ERAS-007 showed significant TGI in pancreatic cancer, CRC, melanoma, and neuroblastoma CDX models at doses ranging from as low as 10 mg/kg BID (p-value < 0.001). At doses ranging from 20 mg/kg BID to 40 mg/kg BID, ERAS-007 showed superior TGI to a clinical-stage ERK inhibitor, ulixertinib, at 75 mg/kg QD, in pancreatic cancer Panc-1 and MIA PaCa-2 CDX models. ERAS-007 at 25 mg/kg BID also showed superior TGI to ravoxertinib at 50 mg/kg BID in the CRC HCT-116 CDX model. Relative to trametinib at 1.5 mg/kg QD, ERAS-007 showed superior TGI in the MIA PaCA-2 CDX model at doses ranging from 20 mg/kg BID to 40 mg/kg BID and in the pancreatic cancer CDX Panc-1 at 40 mg/kg BID. In the neuroblastoma S-K-NAS model, ERAS-007 showed superior TGI at doses as low as 12.5 mg/kg BID to trametinib at 0.15 mg/kg QD. Error bars represent standard error of the mean (SEM).

ERAS-007 showed statistically significant TGI in BRAF V600E CRC and mutant KRAS NSCLC CDX models as a monotherapy and in combination with standard of care targeted therapies and with ERAS-601 (our first MAPKlamp). In the BRAF V600E CRC CDX model RKO, ERAS-007 exhibited 82% TGI as a monotherapy (p-value < 0.001), 88% TGI in combination with encorafenib (p-value < 0.001) and 93% TGI in combination with encorafenib and cetuximab (p-value < 0.001). In the BRAF V600E CRC CDX model WiDr, ERAS-007 exhibited 102% TGI as a monotherapy (p-value < 0.001), 109% TGI in combination with encorafenib (p-value < 0.001), and 111% TGI in combination with encorafenib and cetuximab (p-value < 0.001). Indicated with an asterisk in the graphic, both ERAS-007 combinations achieved statistically significant TGI relative to either the encorafenib and cetuximab combination or ERAS-007 monotherapy (p-values < 0.01).

In the KRAS G12V NSCLC CDX model NCI-H441, the MAPKlamp combination of ERAS-007 at 30 mg/kg QD and ERAS-601 at 15 mg/kg QD achieved a statistically significant TGI of 113% (p-value < 0.001), demonstrating statistically significant benefit relative to the respective monotherapy doses of both ERAS-007 at 30 mg/kg QD and ERAS-601 at 15 mg/kg QD (p-value < 0.01). ERAS-007 as a monotherapy at 30 mg/kg BID and 30 mg/kg QD doses achieved statistically significant TGI of 115% (p-value < 0.001) and 94% (p-value < 0.001), respectively. ERAS-601 as a monotherapy at 30 mg/kg QD and 15 mg/kg QD doses achieved statistically significant TGI of 101% (p-value < 0.001) and 87% (p-value < 0.001), respectively. In the KRAS G12A NSCLC CDX model NCI-H2009, the MAPKlamp combination of ERAS-007 at 30 mg/kg QD and ERAS-601 at 15 mg/kg QD achieved statistically significant TGI of 107% (p-value < 0.001). MAPKlamp achieved a statistically significant combination benefit relative to the respective monotherapy doses of both ERAS-007 at 30 mg/kg QD and ERAS-601 at 15 mg/kg QD (p-value < 0.01). The MAPKlamp combination also showed statistically significant superior TGI relative to ERAS-007 monotherapy at 30 mg/kg BID (p-value < 0.05) and ERAS-601 monotherapy at 30 mg/kg QD (p-value < 0.01). These doses represent the maximum monotherapy nonclinical active doses for ERAS-007 and ERAS-601. ERAS-007 as a monotherapy at 30 mg/kg BID achieved statistically significant TGI of 93%). ERAS-601 as a monotherapy at 30 mg/kg QD and 15 mg/kg QD doses achieved statistically significant TGI of 90% (p-value < 0.001) and 73% (p-value < 0.001), respectively. TGI values >100% indicated tumor regression.



ERAS-007 was profiled in two BRAF V600E CRC CDX models, RKO, which was insensitive to encorafenib and cetuximab treatment, and WiDr, which was sensitive to encorafenib and cetuximab treatment. In both models, ERAS-007 combinations showed superior TGI to encorafenib (Encor.) and cetuximab (Cetux.) monotherapies and to the encorafenib and cetuximab combination (p-value < 0.01). The asterisk in the WiDr graphic indicates that the TGI of the ERAS-007 combinations relative to either the encorafenib and cetuximab combination or ERAS-007 monotherapy was statistically significant (p-value < 0.01). In two mutant KRAS NSCLC CDX models, NCI-H441 and NCI-H2009, the MAPKlamp combination of ERAS-007 and ERAS-601 achieved statistically significant TGI relative

to vehicle (p-values < 0.01) and showed statistically significant combination benefit relative to the respective monotherapy doses used in the MAPKlamp combination (p-values < 0.01). At their active monotherapy doses, ERAS-007 and ERAS-601 also achieved significant TGI in both models as monotherapies (p-values < 0.01).

Clinical development of ERAS-007

Four completed or ongoing clinical trials have evaluated ERAS-007 as monotherapy or in combination in patients with cancer:

- ASN007-101 is a completed open-label, first-in-human, dose-finding trial of ASN007 (ERAS-007) in patients with advanced solid tumors.
- HERKULES-1 is an ongoing open-label, Phase 1b/2, open-label, trial of ERAS-007 (ERK inhibitor) administered as monotherapy or in combination with ERAS-601 (SHP2 inhibitor) to patients with advanced or metastatic solid tumors. HERKULES-1 is no longer enrolling patients.
- HERKULES-2 is a completed open-label Phase 1b/2 master protocol of agents targeting the mitogen-activated protein kinase pathway in patients with advanced non-small cell lung cancer.
- HERKULES-3 is an ongoing open-label Phase 1b/2 master protocol of agents targeting the mitogen-activated protein kinase pathway in patients with advanced gastrointestinal malignancies.

Monotherapy. *ASN007-101* was a Phase 1, open-label, dose finding trial, to evaluate the safety, tolerability, PK, PD, and preliminary anti-tumor activity of ERAS-007 in patients with advanced solid tumors. The trial was completed on June 30, 2020, when the sponsor (Asana) terminated the trial after the primary objective was achieved; the primary objective was to evaluate the safety and tolerability of ERAS-007, characterize the DLTs, determine an MTD, and recommend a Phase 2 dose. Forty-nine patients were treated with ERAS-007 monotherapy at doses ranging from 10 to 80 mg QD (n=17) and 80-350 mg once weekly (QW) (n=32). Based on all safety and tolerability data collected, 40 mg QD and 250 mg QW were considered the MTDs for the QD and QW dosing regimens, respectively. ERAS-007 exhibited relatively rapid absorption, with Tmax generally attained within 4 hours post dose. Terminal half-life (t1/2) was approximately 30 hours. Systemic exposure for ERAS-007 generally increased in a dose related manner. The observed accumulation was consistent with the half-life and dosing frequency of ERAS-007. ERAS-007 showed an expected, reversible, and manageable safety results. Gastrointestinal, skin and ocular toxicities were the most common adverse events (AEs) reported. Objective tumor responses and durable disease control with ERAS 007 were observed in diverse tumor types at doses ranging from 120 to 250 mg once weekly (QW) in patients with BRAF-, HRAS-, and NRAS-driven cancers.

HERKULES-1 is a Phase 1b/2, open-label, dose escalation and dose expansion trial to assess the safety, tolerability, PK, exploratory PD, and preliminary evidence of clinical activity of ERAS 007 monotherapy in patients with advanced or metastatic solid tumors, as well as the dose escalation of ERAS-007 in combination with ERAS-601. The purpose of the monotherapy portion of HERKULES-1 was to assess an alternative schedule of administration of ERAS-007 as well as the effect of food on the administration of ERAS-007. As noted in the ASN007-101 trial, while the QW schedule of ERAS-007 demonstrated clinical activity with acceptable safety results, the PK profile coupled with the safety results suggested that ERAS-007 dosed in a twice a day, once a week (BID-QW) regimen may improve exposure, prolong ERK1/2 inhibition, and increase antitumor activity while maintaining acceptable safety margins. Hence, a primary objective of this protocol is to determine the MTD and recommended dose (RD) of ERAS-007 as a monotherapy administered BID-QW in patients with advanced solid tumors. As of November 30, 2023, 28 patients were treated with ERAS-007 monotherapy at doses ranging from 50 to 125 mg administered BID-QW. Dose escalation for the BID-QW cohort was capped at 125 mg which has an equivalent weekly dose intensity to the MTD identified for the QW schedule (i.e., 250 mg). No DLTs were observed in the BID-QW dose finding cohorts. TRAEs of any grade were reported in 26 (92.9%) of the patients in the BID-QW cohorts, and no Grade 4 or 5 TRAEs were reported in the BID-QW cohorts. The most frequent (occurring in ≥ 20% of patients in the BID-QW cohorts) were nausea (42.9%, Grade 3: 3.6%), dermatitis acneiform (39.3%, Grade 3: 0%), fatigue (32.1%, Grade 3: 7.1%), vomiting (28.6%, Grade 3: 0%), retinopathy (28.6%, Grade 3: 3.6%), diarrhea (25.0%, Grade 3: 0%), and vision blurred (21.4%, Grade 3: 3.6%). Of the 18 patients treated in the BID-QW cohort who were efficacy evaluable, one patient with KRAS G12V pancreatic cancer had an unconfirmed response. As of November 30, 2023, 7 patients were dosed with the combination therapy of ERAS-601 and ERAS-007. The only dosing cohort to open administered ERAS-007 50 mg BID-QW in combination with ERAS-601 40 mg BID (3/1). ERAS-007 TRAEs reported in more than 1 patient included dysgeusia, diarrhea, abdominal pain, rash maculo papular, and fatigue. Of the 7 patients enrolled in the first dosing cohort (ERAS-007 50 mg BID-QW + ERAS-601 40 mg BID [3/1]), 6 were DLT-evaluable, and 2

DLTs were observed: Grade 3 neutropenia which did not recover to an absolute neutrophil count of ≥1000 cells/mm3 within 10 days, and Grade 3 elevated AST. Since the DLT frequency exceeded the per protocol-defined criteria, dose escalation to the next level was not pursued. Based on the inability to increase the dose beyond this first cohort, the decision was made not to pursue this combination further and the cohort was closed to enrollment.

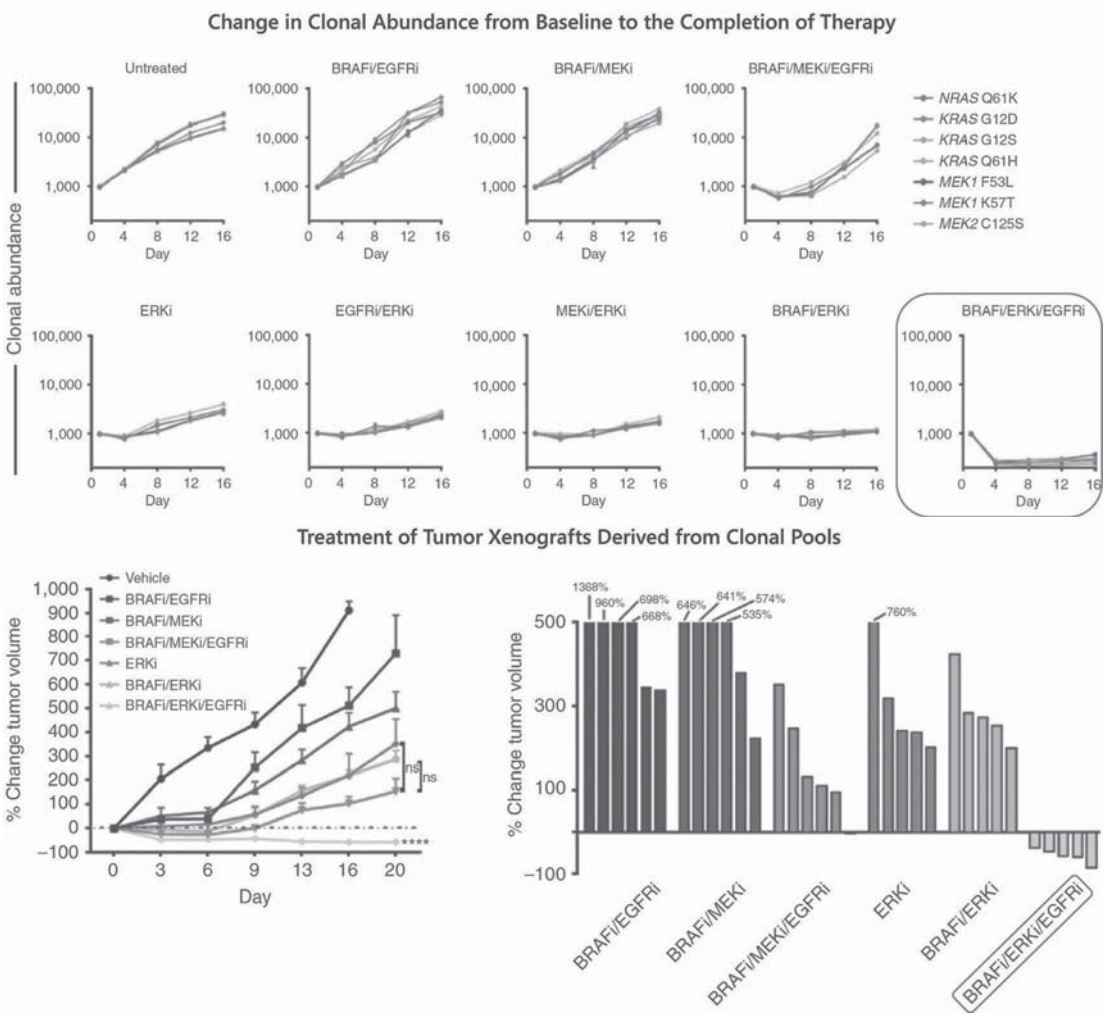
Summary. As a monotherapy**,** ERAS-007 has shown reversible and manageable adverse events, which we believe were consistent with other RAS/MAPK-pathway inhibitors (e.g., MEK inhibitors). In the first in human trial, the ERAS-007 QW dosing schedule was better tolerated than QD dosing based on the TRAEs reported. In HERKULES-1, the TRAEs observed for the BID-QW schedule suggest that this schedule may provide an alternative intermittent option for combination development. Transient nausea and vomiting observed with either the QW or BID-QW dosing schedules were manageable. Skin toxicities have been noted as a class effect of inhibitors of RAF, MEK, or ERK. Less skin toxicity was observed with intermittent dosing of ERAS-007 compared to continuous daily dosing. Ophthalmic toxicities have been observed during treatment with MEK targeted agents and occur with ERK inhibitors, and reversible retinopathy is a well-known MEK/ERK inhibitor class effect.

Rationale for combining with other targeted agents

Since ERK is the terminal node of the RAS/MAPK pathway and activates hundreds to thousands of downstream proteins, we believe an ERK inhibitor is an attractive combination partner to achieve maximal inhibition of the RAS/MAPK pathway. In combination with RTK, SHP2, RAS, and/or RAF inhibitors, an ERK inhibitor has the potential to further inhibit RAS/MAPK pathway signaling and delay development of resistance. The RAS/MAPK pathway is regulated by negative feedback mechanisms that desensitize the pathway when active. In the presence of a RAS/MAPK pathway inhibitor, pathway signaling activity is reduced, alleviating negative feedback mechanisms and sensitizing the RAS/MAPK pathway to upstream signaling. This sensitization can prevent RAS/MAPK pathway inhibitors from achieving therapeutic levels of pathway inhibition. Another challenge for RAS/MAPK pathway inhibitors is the activation of RTKs that can generate sufficient upstream RAS/MAPK pathway signaling pressure that overwhelms RAS/MAPK pathway inhibitors. Combining upstream RAS/MAPK pathway inhibitors with an ERK inhibitor can potentially enable pathway inhibition in the absence of negative feedback and in the presence of additional upstream signaling pressure. The activity of RAS/MAPK pathway inhibitors can also be bypassed by the emergence of activating mutations in RAS/MAPK pathway proteins that lie downstream. For example, activating mutations in RAS can emerge as a resistance mechanism against EGFR inhibitors in mutant EGFR NSCLC, and MEK mutations can develop as a resistance mechanism against BRAF plus MEK inhibitors in melanoma. As the terminal node of the RAS/MAPK pathway, ERK inhibition can help address activating RAS, RAF, or MEK mutations that can act as resistance mechanisms to RAS/MAPK pathway inhibitors.

BRAF V600E CRC as an example that ERK inhibition can reduce the emergence of resistance

While the combination of a BRAF inhibitor and an EGFR inhibitor (encorafenib plus cetuximab) has been approved for the second- and third-line treatment of BRAF V600E CRC, only 20% of patients experience an objective response, and only half of these responses last more than 6 months. Therefore, emergence of resistance is a major therapeutic barrier to long-term clinical benefit. Analysis of post-progression biopsies and cell-free DNA samples revealed a heterogeneous collection of resistance mutations in the RAS/MAPK pathway, including KRAS, NRAS, MEK1, and MEK2. A set of published experiments conducted by researchers at Massachusetts General Hospital modeled this clinical resistance in a pooled clone model system and xenograft models. Seven different resistant BRAF V600E CRC cells, each engineered with one of these resistance mutations, were introduced at 1% allele frequency into a pool of sensitive BRAF V600E CRC cells. Of all combination therapies evaluated, a triple blockade of BRAF, EGFR, and ERK (identified with a red box around the image below) proved to be the most effective in reducing tumor volume and preventing the emergence of resistant clones.



These data suggest that: (1) in tumors that are highly addicted to the RAS/MAPK pathway, such as BRAF V600E CRC, resistance mechanisms are dominated by reactivation of this critical pathway via mutations within the pathway, and (2) an ERK inhibitor can potentially overcome these resistance mechanisms by blocking the terminal node of the pathway. Therefore, we believe combining ERAS-007 with other RAS/MAPK pathway inhibitors (e.g., KRAS G12C inhibitor and BRAF inhibitor) as either initial therapy or in the post-progression setting in patients who have been treated with RAS/MAPK pathway inhibitors may lead to improved clinical activity.

Development strategy for ERAS-007

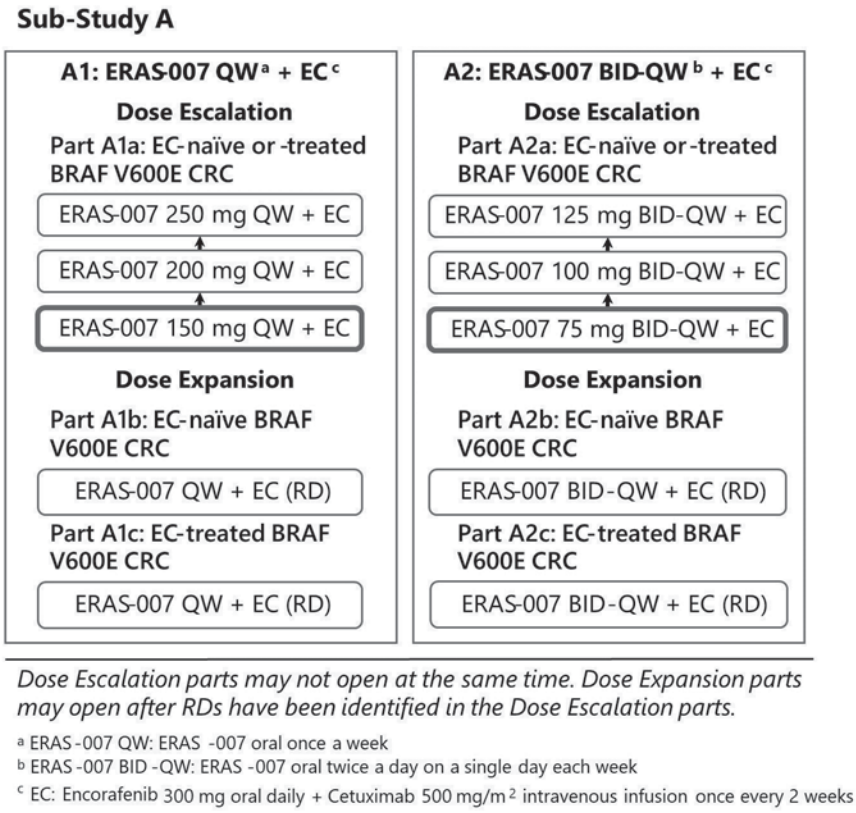
We are pursuing clinical development for ERAS-007 in combination with approved and investigational agents.

As shown in the schema below, **HERKULES-3** is a Phase 1b/2 master protocol evaluating novel combination therapies for patients with GI malignancies. Sub-Study A of the **HERKULES-3** trial is focused on patients with BRAF V600E-mutated CRC, representing approximately 180,000 new patients worldwide each year. The master protocol for this clinical trial may be expanded in the future to include other novel combinations and indications in GI cancers. We dosed the first patient in **HERKULES-3** in September 2021.

The standard of care for patients with BRAF V600E CRC in the second-/third-line metastatic setting is EC, an anti-BRAF and anti-EGFR doublet therapy. Only 20% of patients respond, nearly all patients experience disease progression, and the mOS is less than 9 months. The prognosis for patients in the post-EC setting is worse. In preclinical models of BRAF V600E CRC, the addition of an ERK inhibitor to BRAF inhibitor plus EGFR inhibitor substantially enhanced anti-tumor activity and reduced the development of resistance to BRAF inhibitor plus EGFR inhibitor. When the dosing regimen of ERAS-007 was changed from QW to BID-QW in an effort to decrease Cmax-driven toxicity, **Part A2** was opened for escalation. The highest dose evaluated and cleared by the safety review committee was 100 mg ERAS-007 BID-QW in combination with the approved doses of EC. While dose escalation initially enrolled two patient populations (BRAF V600E

CRC patients who are naïve to EC treatment and who have been treated with EC), expansion is focused on those patients who are EC-naïve.

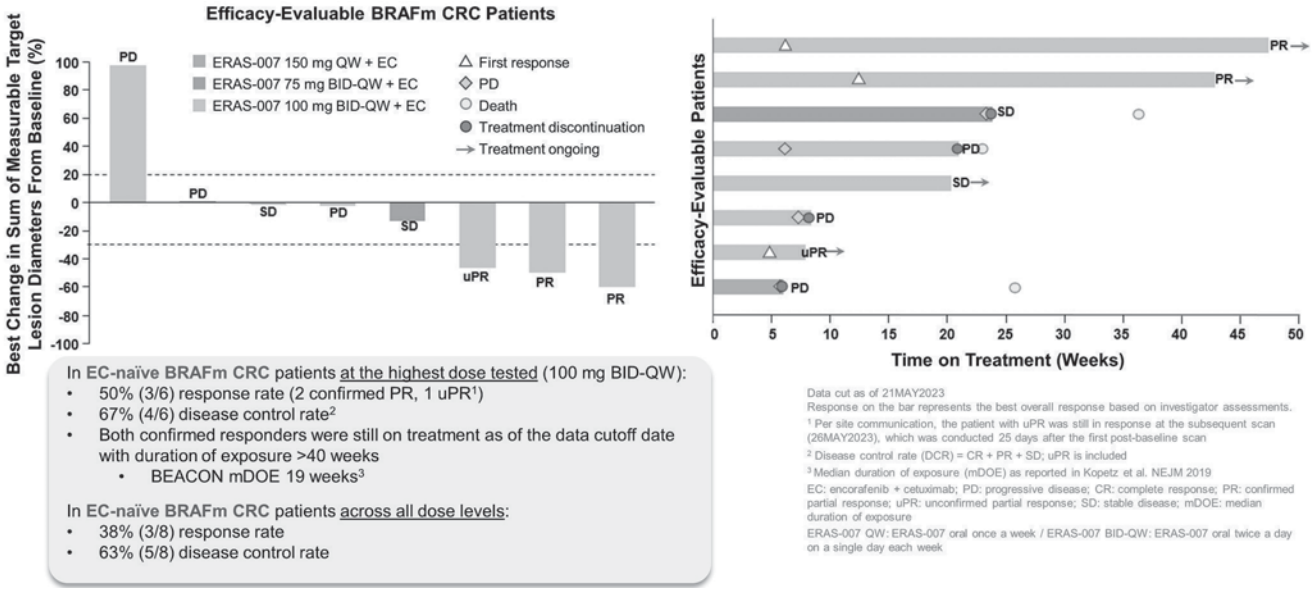
HERKULES-3 Sub-Study A: BRAF V600E CRC



Dose Escalation parts may not open at the same time. Dose Expansion parts may open after RDs have been identified in the Dose Escalation parts.

[a] ERAS-007 QW: ERAS -007 oral once a week
[b] ERAS-007 BID-QW: ERAS -007 oral twice a day on a single day each week
[c] EC: Encorafenib 300 mg oral daily + Cetuximab 500 mg/m^2 intravenous infusion once every 2 weeks

As of March 23, 2023, 20 patients with BRAFm CRC had been treated with escalating doses of ERAS-007 in combination with the approved doses of EC. The combination showed acceptable preliminary safety and tolerability results with 17 (85%) patients experiencing ERAS-007-related AEs, most of which were grade 1 and 2 with no grade 4 or 5 events. The most common (occurring in ≥ 20% of patients) ERAS-007-related AEs were fatigue (35%, Grade 3: 5%), diarrhea (30%, Grade 3: 0%), headache (25%, Grade 3: 5%), anemia (25%, Grade 3: 10%), nausea (25%, Grade 3: 0%), subretinal fluid (20%, Grade 3: 0%), and vomiting (20%, Grade 3: 0%). As of May 21, 2023, in EC-naïve efficacy-evaluable patients, across all dose levels, the response rate was 38% (3/8) and the disease control rate (complete response [CR] + partial response [PR] + stable disease [SD]) was 63% (5/8). At the highest dose evaluated (ERAS-007 100 mg BID-QW), the response rate was 50% (3/6; 2 confirmed PRs and 1 unconfirmed PR) and the disease control rate was 67% (4/6). Both confirmed responders were still on treatment with duration of exposure > 40 weeks as of the data cut-off.



Summary. ERAS-007 in combination with EC has shown acceptable safety and tolerability results with the most common ERAS-007-related events generally consistent with the mechanism of action with no new safety signals identified. Encouraging clinical activity has been observed in EC-naïve patients and additional enrollment is ongoing. Updated interim data are expected in H1 2024.

ERAS-801: our CNS-penetrant EGFR inhibitor

EGFR is a transmembrane protein and member of the ErbB family of receptor tyrosine kinases (RTKs) that under normal conditions bind various growth factors to activate cellular signaling to regulate homeostasis. However, when the receptor is overexpressed, amplified, and/or mutated, it becomes oncogenic, thereby contributing to cell survival, proliferation, and metastasis.

EGFR-mediated signaling plays a key role in the growth of many tumor types. Targeting of wildtype EGFR (wtEGFR) and mutant variants of EGFR (EGFRm) by small molecules and antibodies has resulted in improved patient outcomes in NSCLC, CRC, and HNSCC. However, the ability of these agents to effectively target wtEGFR and EGFRm in the CNS remains an unmet medical need. For example, in primary CNS tumors like GBM that have amplification of wtEGFR as well as expression of a mutation in the extracellular domain, the most common of which is epidermal growth factor receptor variant III (EGFRvIII), approved small molecule EGFR inhibitors have not demonstrated clinical activity.

The lack of clinical activity is likely multifactorial, but we believe there are two primary reasons why approved EGFR inhibitors are not effective: (1) the molecules do not penetrate the CNS well, and (2) the molecules are weak inhibitors of GBM-relevant mutant EGFR proteins, such as EGFRvIII, as homodimers or heterodimers that include wildtype EGFR.

ERAS-801 is designed to be a potent, selective, reversible, and orally available small molecule with both: (1) highly enhanced CNS penetration (8.2:1 brain:plasma ratio in mice, based on updated PK data generated by Erasca) and (2) the ability to target both EGFR mutants such as EGFRvIII, the most common mutant form of EGFR found in GBM, and wtEGFR, which heterodimerizes with EGFRvIII.

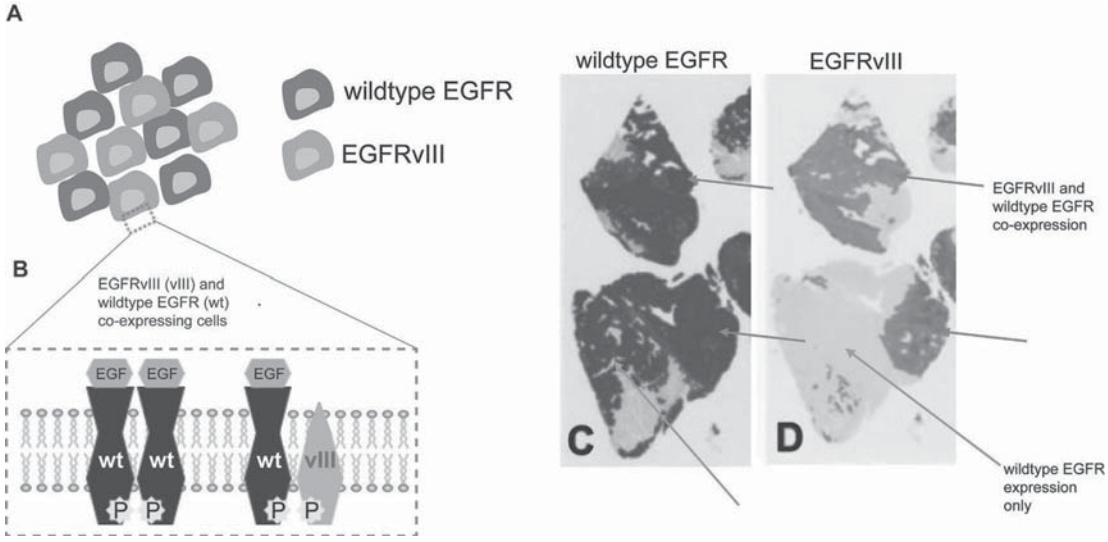
High CNS penetration of ERAS-801

Whereas approved EGFR inhibitors have suboptimal CNS penetration for primary brain tumors, as shown below, ERAS-801 showed substantially higher values of K_p and $K_{p,uu}$ (partition coefficients that measure bound and unbound drug concentration, respectively) compared to osimertinib, afatinib, erlotinib, gefitinib, and dacomitinib. The figure below is for illustrative purposes only and is not a head-to-head comparison. These data were generated from different studies, and caution should be exercised when comparing data across studies.

Compound (Brand Name)	Company	K_p, brain (mouse)	$K_{p,uu}$, brain (mouse)
ERAS-801	Erasca	8.2	1.3
Osimertinib (Tagrisso)	AstraZeneca	0.99	0.29
Afatinib (Gilotrif)	Boehringer Ingelheim	0.25	0.05
Erlotinib (Tarceva)	Genentech	0.06	0.13
Gefitinib (Iressa)	AstraZeneca	0.36	0.10
Dacomitinib (Vizimpro)	Pfizer	0.61	0.49

Dual targeting of EGFR alterations and wtEGFR in GBM to address heterodimerization

The most common mutant form of EGFR found in GBM is EGFRvIII. Given the promiscuous nature of EGFR signaling, ERAS-801 has been specifically designed to have activity against both EGFR alterations such as EGFRvIII and wildtype EGFR, as we believe that wtEGFR inhibition is critical to impairing the growth of EGFR altered GBM because of the propensity of wtEGFR to heterodimerize with EGFRvIII to drive oncogenic signaling, as seen below with substantial co-expression of EGFRvIII and wtEGFR.



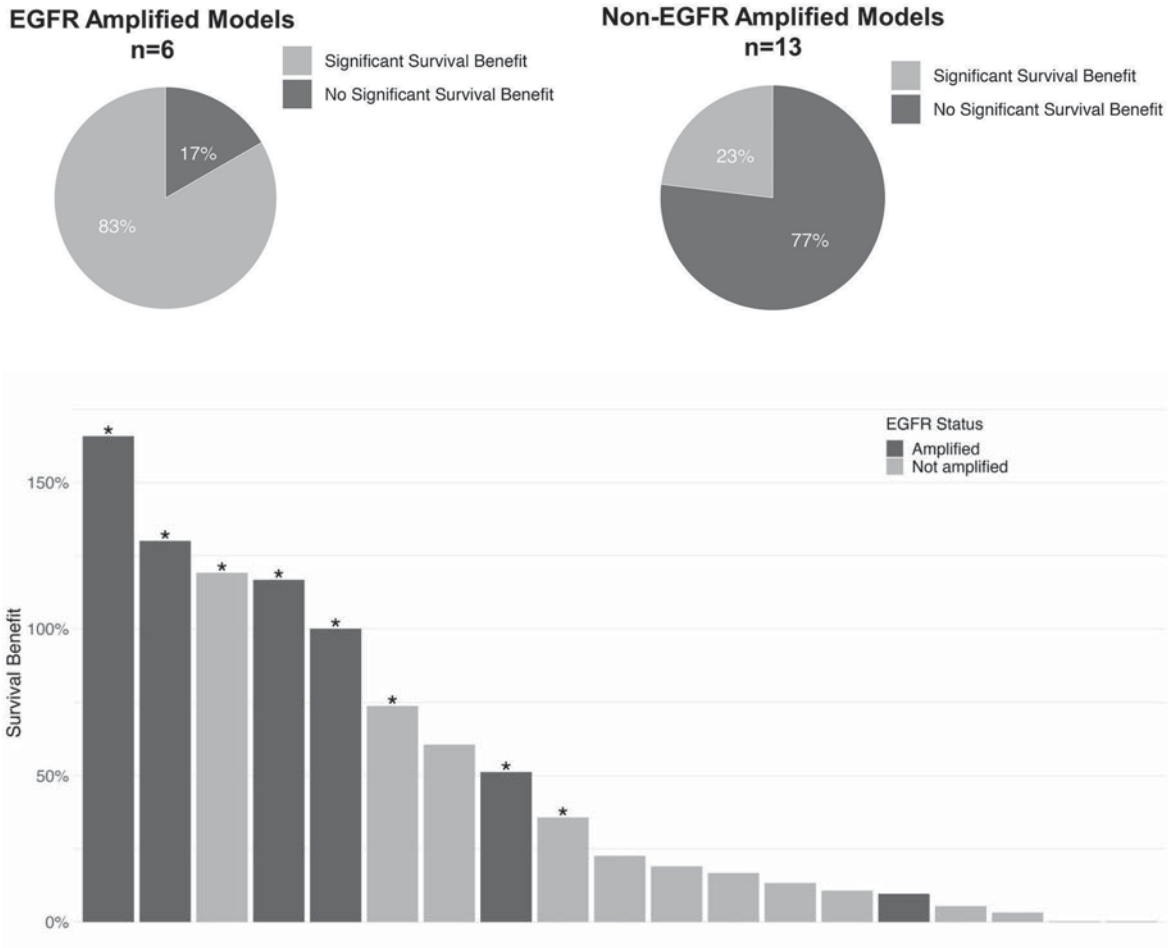
Panel A shows that the EGFR splice variant mutant EGFRvIII may be expressed in a subset of GBM tumor cells and that it can be co-expressed with wildtype EGFR. Panel B shows a zoomed in diagram of a GBM tumor cell membrane that harbors both wildtype EGFR and EGFRvIII. Wildtype EGFR can homodimerize with another wildtype EGFR protein or heterodimerize with EGFRvIII, in each case potentially leading to oncogenic signaling. In panels C and D, an immunohistochemistry-stained section of GBM tumor tissue shows wildtype EGFR-expressing tumor cells in brown and EGFRvIII-expressing tumor cells in blue. Regions that are stained both brown and blue express both wildtype EGFR and EGFRvIII proteins while regions that are stained brown but not blue express wildtype EGFR only.

Preclinical profile of ERAS-801

In preclinical studies, ERAS-801 has demonstrated strong biochemical and cell-based potency, as well as strong biochemical selectivity. ERAS-801 has shown high potency against EGFR with a biochemical IC50 of 0.3 nM and high CNS penetration. It also showed high selectivity for EGFR based on a biochemical screen of 484 kinases in which ERAS-801 at 10 μM inhibited only two non-EGFR family kinases at greater than 90%.

In cell-based assays, ERAS-801 was potent against wildtype EGFR with an IC50 of 1.3 nM and EGFRvIII with an IC50 of 1.5 nM. In an 18 in vitro patient-derived GBM cell panel, ERAS-801 showed statistically significantly greater in vitro activity in EGFR amplified GBM models than in non-amplified models, as measured by IC50 values (t-test p-value = 0.01). ERAS-801 exhibited submicromolar IC50s in 83% of EGFR amplified models (n=6) and in only 17% of non-EGFR amplified models (n=12).This GBM cell panel included the most frequent types of EGFR alterations observed in GBM: amplification, EGFRvIII, extracellular domain mutations (e.g., A289V and A289D), and chromosome 7 polysomy.

The CNS penetration of ERAS-801 was studied in mice following single oral dose administration. ERAS-801 exhibited extensive CNS penetration in mice. The brain-to-plasma partition coefficient (Kp) based on AUC ratio of the total concentrations of ERAS-801 was 8.2; whereas the corresponding unbound partition coefficient (Kpuu) of ERAS-801 was 1.3. ERAS-801 also exhibited extensive CNS penetration in rats, measured both after a single oral dose and after 14 days of continuous once daily oral administration. After a single dose, Kp of ERAS-801 was 9.3, whereas Kpuu of ERAS-801 was 1.7. After 14 days of once daily oral administration, Day 14 mean Kp was 3.3-4.8.



ERAS-801 was evaluated at 25 mg/kg QD in 19 patient-derived glioma models. This patient-derived glioma model set was intended to capture the heterogeneity of GBM by encompassing a variety of disease stages (e.g., primary or recurrent), patient sex, and MGMT methylation status. Survival benefit indicated the duration that mice treated with ERAS-801 survived relative to mice treated with vehicle. An asterisk indicates models in which survival benefit was statistically significant (Logrank test p-value < 0.05). In this model set, ERAS-801 treatment resulted in significant survival benefit in 83% of patient-derived glioma models that harbored an EGFR amplification. In contrast, ERAS-801 treatment resulted in significant survival benefit in 23% of models that did not harbor an EGFR amplification, EGFRvIII, or EGFR extracellular domain mutation. Survival benefit associated with a p-value < 0.05 was considered significant.

Development strategy for ERAS-801

GBM is a difficult-to-treat, aggressive cancer that can occur in the brain or spinal cord. Current therapy consists primarily of surgical resection of the tumor, followed by radiation and chemotherapy. Once GBM recurs, therapeutic options for patients are limited. EGFR amplifications and mutations are detected in up to 60% of GBM cases and are generally indicative of poor prognosis. In May 2023, we announced that the FDA granted FTD to ERAS-801 for the treatment of adult patients with GBM with EGFR gene alterations. In June 2023, we announced that the FDA granted ODD to ERAS-801 for the treatment of patients with malignant glioma, which includes GBM. In February 2022, we dosed the first patient in our THUNDERBBOLT-1 Phase 1 clinical trial in recurrent GBM that will evaluate the safety, PK, and PD effects of ERAS-801 as a single agent. Preliminary evaluation of anti-tumor activity will also be performed in patients who have tumors harboring alterations in EGFR. In November 2023, we announced that the MTD was established, and the program transitioned to the next phase of development focusing on identification of the recommended Phase 2 dose and efficacy signal seeking. Preliminary clinical data from the THUNDERBBOLT-1 trial are expected in 2024.

ERAS-601: our SHP2 inhibitor

ERAS-601 is designed to be a potent and selective oral inhibitor of SHP2. In preclinical studies, ERAS-601 has demonstrated strong in vitro potency relative to other SHP2 inhibitors (RMC-4550 and TNO155) and favorable absorption, distribution, metabolism, and excretion (ADME) and PK properties, which we believe support its use in a broad range of combination therapies.

In our first-in-human trial, FLAGSHP-1, we evaluated the safety, tolerability, PK, PD, and preliminary anti-tumor activity of ERAS-601 in patients with advanced or metastatic solid tumors; however, this trial was deprioritized in November 2023, even though ERAS-601 administered as a monotherapy was safe and tolerable while achieving confirmed responses as a monotherapy and in combination with cetuximab. We consider ERAS-601 a potential combination agent with other RAS/MAPK pathway targeting compounds in our pipeline, as well as with standard of care agents.

Preclinical profile of ERAS-601

In a biochemical assay, ERAS-601 potently and selectivity inhibited full length SHP2 with an IC50 value of 4.6 nM as shown in the table on the left below. By binding to an allosteric pocket that is present only in the inactive conformation of SHP2, ERAS-601 inhibited SHP2 activity by stabilizing the protein in the inactive state. No ERAS-601 activity was observed against 10 other phosphatases (including SHP1), and ERAS-601 showed no strong inhibition of any kinase in a 300-kinase panel (i.e., less than 30% inhibition at 1 μM), demonstrating high selectivity as shown in the table on the right below.

Compound	Biochemical SHP2 inhibition IC50 (nM)
ERAS-601	4.6

ERAS-601 demonstrated no off-target activity in 300 kinase (<30% inhibition @ 1μM) and 12 phosphatase panels (IC50 >10μM)

	Phosphatase	% inhibition at 10 μM ERAS-601 relative to DMSO control
Off target	PP1B	0
	PP1A	0
	PP2A Alpha / PP2R1A complex	1
	PTPRC	6
	DUSP22	0
	PTPN2	3
	PTPN7	0
	PTPN12	0
	PTPN1	0
	PTPN6 (SHP1) full length	0
	PTPN11 (SHP2) catalytic domain	0
On target	PTPN11 (SHP2) full length	100

Biochemical on-target activity of ERAS-601 against SHP2 (left) and biochemical activity of ERAS-601 in a panel of 12 phosphatases (right). PTPN11 (SHP2) catalytic domain protein is a truncated form of SHP2 (246 aa – 593 aa). This truncated form contains a phosphatase domain and is missing two regulatory domains. The PTPN11 (SHP2) catalytic domain does not harbor the binding site of ERAS-601 due to these missing domains, while the PTPN11 (SHP2) full length protein does harbor ERAS-601's binding site.

The ADME/PK properties of ERAS-601 have been extensively evaluated in non-clinical studies. As shown in the table below, ERAS-601 demonstrated favorable physicochemical and PK properties, including low risk of drug-drug interaction (DDI), negligible CYP enzyme inhibition, and moderate plasma protein binding. It also showed high oral bioavailability and low clearance across multiple animal species. We believe these properties support ERAS-601's development in a broad range of combination therapies.

Assay	ERAS-601
cLogP/PSA	<1/<130
MW	<600
PBS solubility (μM)	>300
Caco2 permeability at 10 μM, P_{app} (AB/BA) (10^{-6}, cm/s)	2.57/27.5
Plasma protein binding, Free fraction % M/R/D/H	26/12/35/33
Stability in liver microsomes M/R/D/H	Low Clearance
Inhibition of CYP 3A4, 2C9, 2D6, IC50 (μM)	>100
CYP3A4 TDI	No flag
hERG Q-patch IC50 (μM)	>30
GLP hERG IC50 (μM)	12

Preclinical anti-tumor activity of ERAS-601

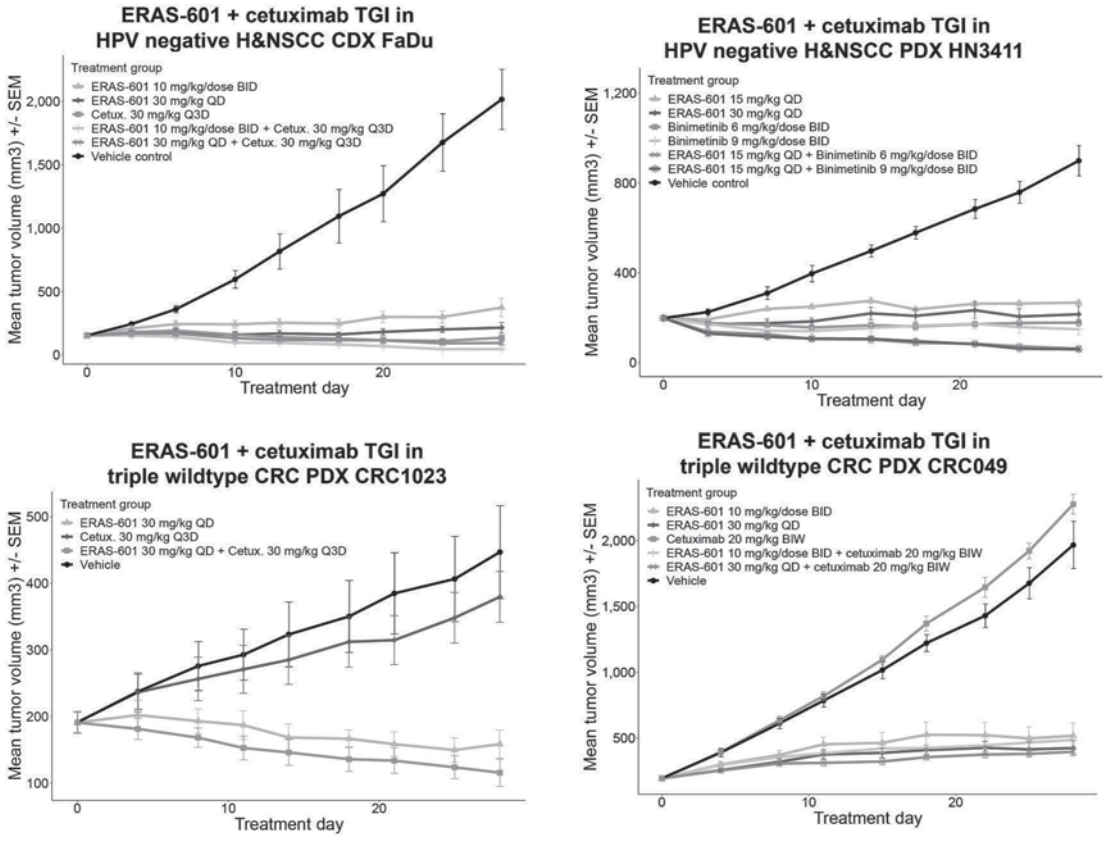
As shown in the table below, ERAS-601 significantly inhibited tumor growth as a monotherapy in 18 in vivo models, including HPV-negative, triple wildtype, KRAS G12D, KRAS G12V, EGFR amplified, BRAF Class I and III, and NF1 loss-of-function mutations. In 13 models, ERAS-601 was administered at QD and BID dose schedules. Both dose schedules were well tolerated and showed significant TGI. In a PK/PD study, ERAS-601 also achieved time and dose-dependent increases in plasma concentrations and concomitant reductions in RAS/MAPK pathway signaling, as measured by pERK, in the KRAS G12C-mutated NSCLC xenograft model NCI-H358. Tumor pERK1/2 levels were reduced by more than 50% when ERAS-601 total plasma concentrations exceeded or approximated the IC50/fu, which is the in vitro cellular pERK IC50 unbound fraction in plasma.

Mutation	Model ID	Tumor type	Antitumor activity of ERAS-601	
			10 mg/kg BID (% TGI)	30 mg/kg QD (% TGI)
HPV-negative	FaDu	H&NSCC	88%***	97%***
	HN3411	H&NSCC	Not evaluated	97%***
Triple wildtype	CR049	CRC	82%***	87%***
	CR021	CRC	106%***	106%***
	CR1023	CRC	Not evaluated	113%**
$KRAS^{G12D}$	LUN232	NSCLC	Not evaluated	73%***
	GP2D	CRC	60%**	71%**
	LS513	CRC	66%*	77%**
	LUN137	CRC	Not evaluated	82%*
$KRAS^{G12V}$	H441	NSCLC	Not evaluated	98%***
EGFR amplification	KYSE-520	Esophageal	100%***	101%***
BRAF class I (BRAF V600E)	WiDr	CRC	67%***	68%***
BRAF class III	NCI-H508	CRC	136%**	135%**
	LUN023	NSCLC	100%*	123%**
$NF1^{LOF}$	MeWo	Melanoma	86%***	85%***
	NCI-H1838	NSCLC	140%**	144%**
	LUN150	NSCLC	167%***	167%***
	LU6484	NSCLC	77%***	83%***

*ERAS-601 exhibited significant TGI relative to vehicle control (p-value < 0.05) in two HPV-negative, three triple wildtype (KRAS/NRAS/BRAF wildtype), five KRAS mutant, one EGFR amplified, three BRAF mutant, and four NF1 LOF mutant CDX and PDX models. Significant TGI was observed at both 30 mg/kg QD and 10 mg/kg BID doses. *p-value < 0.05 **p-value < 0.01 ***p-value < 0.001 (p-values assessed relative to vehicle control)*

Preclinical activity of ERAS-601 combination therapies

As shown in the figures below, when combined with an EGFR inhibitor, ERAS-601 showed significantly greater TGI than dosing of these inhibitors as monotherapies. This benefit was observed in models that harbored mutations both upstream and downstream of SHP2. These ERAS-601 combinations were generally well tolerated across the tested models as demonstrated by the minimal percentage body weight changes observed.



*ERAS-601 combined with cetuximab showed significant TGI in four CDX and PDX models. The ERAS-601 and cetuximab (EGFR inhibitor) combination showed TGI in two HPV-negative HNSCC CDX and PDX models and two triple wildtype (*KRAS/NRAS/BRAF wildtype) *CRC PDX models relative to vehicle control (p-value < 0.01) and superior TGI to cetuximab monotherapy treatment.*

Development strategy for ERAS-601

Our development plan aims to advance ERAS-601 in combination with other targeted agents to prevent and overcome adaptive resistance mechanisms in order to achieve more durable clinical benefit. Given the wide range of cancers that are dependent on SHP2, we believe ERAS-601 could serve as a backbone for compelling combination therapies to prolong survival for patients.

MAPKlamp: our therapeutic strategy targeting proximal and distal nodes of the RAS/MAPK pathway

MAPKlamp is our novel approach targeting upstream and downstream nodes in the RAS/MAPK pathway designed to shut down, or "clamp," the signaling of various oncogenic drivers, such as RTKs, NF1, RAS, RAF, and MEK alterations trapped between inhibited nodes. With our MAPKlamp approach, we aim to induce tumor regression in RAS/MAPK pathway-driven cancers, while also blocking the main escape routes that lead to tumor resistance.

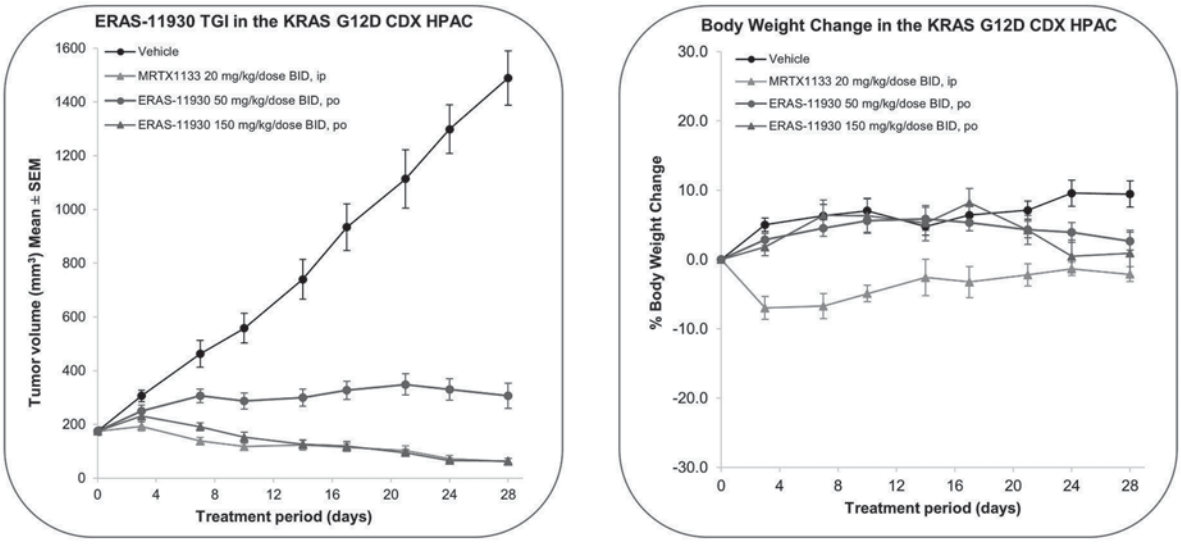
ERAS-4: our program targeting KRAS mutations beyond G12C

Nearly 2 million patients annually worldwide are affected by KRAS mutations other than KRAS G12C. For example, nearly 700,000 of these patients are affected by tumors that harbor KRAS G12D, which is the most prevalent KRAS mutation. Activating KRAS mutations beyond G12C result in hyperactive RAS/MAPK pathway signaling and are frequently observed in NSCLC, CRC, endometrial cancer, and pancreatic cancer. Our ERAS-4 program endeavors to develop small molecules that potently and selectively inhibit KRAS mutations beyond G12C, such as KRAS G12D and KRAS G12V. These inhibitors will prevent RAS-mediated signaling by locking mutant KRAS in the inactive GDP-bound state and/or obstructing mutant KRAS's ability to bind downstream effector proteins, such as BRAF and CRAF. We are accelerating advancement

of this program by leveraging our in-house chemistry, biology, and structural biology expertise gained from working on our RAS-GDP and other RAS-GTP programs. We have generated multiple series of orally bioavailable pan-KRAS inhibitors with low nanomolar IC50 potencies in biochemical and cellular assays against KRAS G12D and KRAS G12V, with high selectivity against NRAS and HRAS. ERAS-11930, an ERAS-4 molecule, showed comparable in vivo activity, when administered orally at 150 mg/kg BID, to MRTX1133, when administered intraperitoneally (IP) at its MTD of 20 mg/kg BID. Though MRTX1133 was not orally bioavailable, it served as a relevant benchmark since we believed that it was considered one of the most potent S-IIP binding selective inhibitors of KRAS G12D currently in clinical development.

		Erasca's Internal pan-KRAS Compounds				Coopetitors' Compounds		
Assay		ERAS-12943	ERAS-12879	ERAS-12056	ERAS-11930	MRTX1133	RMC-6236	Loxo LY-4066434
Inhibitor Class		S-IIP targeting	S-IIP targeting	S-IIP targeting	**S-IIP targeting**	S-IIP targeting	Molecular Glue (Ras and Cyclophilin A)	S-IIP targeting
Target(s)		Pan-KRAS	Pan-KRAS	Pan-KRAS	**Pan-KRAS**	KRAS G12D Selective	Pan-RAS	Pan-KRAS
KRAS G12D Kd by SPR (nM)		Queued	Queued	0.24	**0.012**	~0.0002	Not relevant for S-IIP inhibitor comparisons	0.44
KRAS WT Kd by SPR (nM)		Queued	Queued	0.35	**0.19**	0.31	Not relevant for S-IIP inhibitor comparisons	0.26
KRAS G12D AsPC-1	4/24-hour pERK IC_{50} (nM)	1.5 / 3.6	5.4 / 6.5	6.7 / 48	**4 / 20**	6	0.4-3*	13
	5-day 3D CTG IC_{50} (nM)	1.9	5.4	17.7	**8.2**	20	1-27*	29
KRAS G12V SW620	4-hour pERK IC_{50} (nM)	Queued	2.3	8.0	**2.4**	ND	0.4-3*	8.5
	5-day 3D CTG IC_{50} (nM)	Queued	29	24.2	**20**	ND	1-27*	30
% F (PO dose)		14 (40 mg/kg)	32 (50 mg/kg)	12 (50 mg/kg)	**13.5 (50 mg/kg)**	0.2 (10 mg/kg)	24-33 (10 mg/kg)	43 (30 mg/kg)
PK Species		mouse	mouse	mouse	**mouse**	rat	mouse	mouse

In vitro potency and rodent PK of four ERAS-4 compounds (teal) and three coopetitor compounds (blue). ERAS-4 showed sub-nanomolar binding affinities to KRAS G12D and KRAS WT, as measured by SPR. ERAS-4 molecules showed comparable inhibition of RAS/MAPK signaling and inhibition of cellular viability in the KRAS G12D PDAC cell line, HPAC, and the KRAS G12V CRC cell line, SW620. The ERAS-4 compounds showed promising oral bioavailability, exemplified by % F values > 10. ERAS-4 data were generated internally and coopetitor data were set forth in public disclosures. An asterisk indicates ranges that were generated in a G12X cell line panel.



ERAS-11930, orally administered at 150 mg/kg BID, achieved tumor regression in the KRAS G12D CDX PDAC model HPAC that was comparable to the maximum tolerated dose of MRTX1133 in mouse, non-orally administered (i.e., interperitoneal administration) at 20 mg/kg BID. ERAS-11930 showed dosed dependent activity, achieving 90% TGI at 50 mg/kg BID and 109% TGI (63% regression) at 150 mg/kg BID. MRTX1133 at 20 mg/kg BID, IP achieved

100% TGI (3% regression). Both ERAS-11930 doses were well tolerated throughout the treatment period of 28 days, as demonstrated by no body weight loss or health observations.

ERAS-12: our EGFR D2/D3 bispecific antibody program

Inhibition of wildtype EGFR signaling mediated by overexpression of EGFR has shown promise in treating various tumors, including HNSCC and CRC. In tumors where overexpression of EGFR is thought to be the primary driver of EGFR signaling, an antibody-based approach is the most effective way to target the receptor, and approved antibodies have demonstrated good tolerability as well as activity by inhibiting EGFR activation and mediating antibody-dependent cellular cytotoxicity, a process by which the antibody alerts the immune system to attack the bound tumor cell. However, all approved anti-EGFR antibodies target domain III (D3) only, which is the inactive conformation of wildtype EGFR, and no approved antibodies target domain II (D2), which is the active, ligand binding, conformation of wildtype EGFR. Antibodies targeting D2 are expected to be more effective when epidermal growth factor (EGF) or other members of the EGF family are overexpressed.

We are developing a bispecific antibody that is active against both the inactive and active conformations of wildtype EGFR.

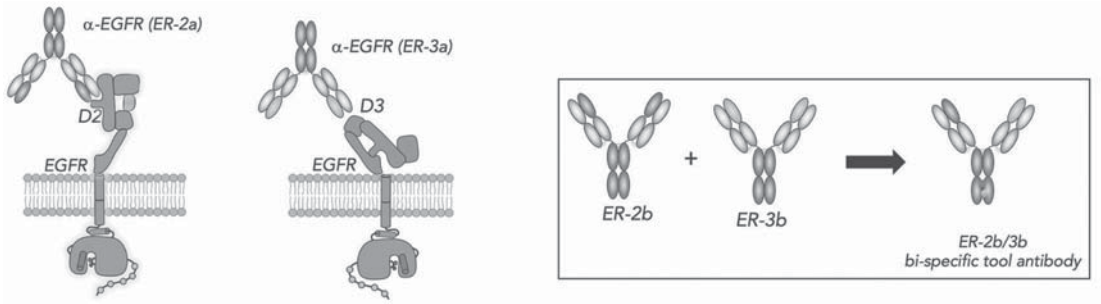
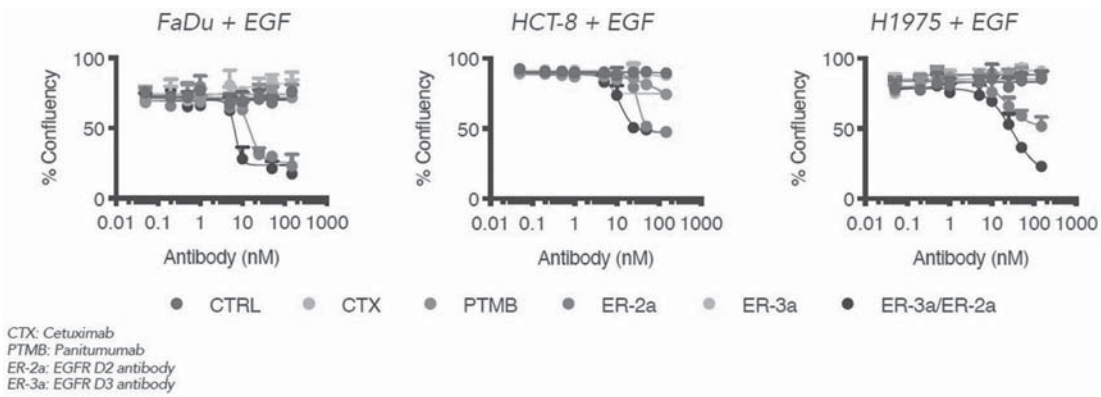


Diagram (A) visualizes the EGFR antibody ER-2a binding to the extracellular domain II of EGFR wildtype (purple), which is accessible when EGFR is in the active state. EGFR assumes an active state conformation when its ligand is bound (the bound ligand is shown in blue). Diagram (B) visualizes the EGFR antibody ER-3a binding to the extracellular domain III of EGFR wildtype (purple), which is accessible when EGFR is in the inactive state. In the rectangle, the portion of ER-2b that recognizes domain II of EGFR and the portion of ER-3b that recognizes domain III of EGFR are combined into a bispecific antibody that binds EGFR in both states.

By binding to EGFR in the active D2 state, our D2/D3 bispecific antibody can likely better prevent EGFR dimerization and can potentially achieve higher levels of EGFR inhibition than currently approved EGFR antibodies. Achieving a higher level of EGFR inhibition may better control tumor growth and delay the emergence of resistance mechanisms involving EGFR that spends more time in the active conformation.

Targeting D2 via the ER-3a/2a and ER-2a antibodies show a concentration-dependent inhibition of cancer cell proliferation.



The bispecific antibody ER-3a/ER-2a and EGFR active state-binding antibody ER-2a inhibited cell growth in FaDu, an HNSCC cell line, and HCT-8, a CRC cell line, and the NSCLC cell line H1975. FaDu and HCT-8 expressed wildtype EGFR and H1975 expressed EGFR with two kinase domain mutations, L858R and T790M. EGFR's ligand, EGF, was added to these cells to further stimulate EGFR activity and model environments where EGF is expressed. As expected, only the two antibodies that recognized the active state of EGFR, ER-3a/ER-2a, inhibited the proliferation of all three cell lines, as indicated by a reduced confluency percentage.

Our acquisition and license agreements

Novartis

In December 2022, we entered into an exclusive license agreement (as amended, the Novartis Agreement) with Novartis under which we were granted an exclusive, worldwide, royalty-bearing license to certain patent and other intellectual property rights owned or controlled by Novartis to develop, manufacture, use, and commercialize naporafenib in all fields of use. We have the right to sublicense (through multiple tiers) our rights under the Novartis Agreement, subject to certain limitations and conditions, and are required to use commercially reasonable efforts to commercialize licensed products in certain geographical markets.

The license granted under the Novartis Agreement is subject to Novartis' reserved right to: (i) develop, manufacture, use, and commercialize compounds unrelated to naporafenib under the licensed patent rights and know-how, (ii) use the licensed patent rights and know-how for non-clinical research purposes, and (iii) use the licensed patent rights and know-how to the extent necessary to perform ongoing clinical trials and its obligations under existing contracts and under the Novartis Agreement.

Under the Novartis Agreement, we made an upfront cash payment to Novartis of $20 million and issued 12,307,692 shares of our common stock to Novartis. We are obligated to make future regulatory milestone payments of up to $80 million and sales milestone payments of up to $200 million. We are also obligated to pay royalties on net sales of all licensed products, in the low-single digit percentages, subject to certain reductions.

The Novartis Agreement will expire upon the last to expire royalty term, which is determined on a licensed product-by-licensed product and country-by-country basis, and is the later of: (i) ten years from the date of first commercial sale for the licensed product in such country, (ii) the last to expire valid claim within the licensed patent rights covering such licensed product, or (iii) the expiration of all regulatory exclusivity for the licensed product in such country. Upon expiration of the Novartis Agreement, on a licensed product-by-licensed product and country-by-country basis, we will have a fully paid-up, perpetual, and irrevocable license to develop, manufacture, use, and commercialize the licensed products.

The Novartis Agreement may be terminated in its entirety by either party in the event of an uncured material breach by the other party. Novartis may terminate the Novartis Agreement upon written notice in the event we become subject to specified bankruptcy, insolvency, or similar circumstances. We may terminate the Novartis Agreement in its entirety at any time upon the provision of prior written notice to Novartis.

Upon termination of the Novartis Agreement for any reason, all rights and licenses granted to us will terminate. In addition, upon termination of the Novartis Agreement for any reason other than its natural expiration, Novartis has an option to negotiate a license under any patent rights, know-how, or other intellectual property rights relating to the licensed products that are owned or controlled by us for the purpose of developing, manufacturing and commercializing the licensed products on terms to be negotiated between the parties.

Asana BioSciences

In November 2020, we entered into an agreement and plan of merger with Asana and ASN Product Development, Inc. (ASN) (the Asana Merger Agreement), pursuant to which ASN became our wholly-owned subsidiary. Asana and ASN had previously entered into a license agreement, which was amended and restated prior to the closing of the merger transaction (the Asana License Agreement, and collectively with the Asana Merger Agreement, the Asana Agreements), pursuant to which ASN acquired an exclusive, worldwide license to certain intellectual property rights relating to inhibitors of ERK1 and ERK2 owned or controlled by Asana to develop and commercialize ERAS-007 and certain other related compounds for all applications. We have the right to sublicense (through multiple tiers) the licensed rights under the Asana Agreements, subject to certain conditions. The foregoing license is subject to Asana's non-exclusive right to practice the licensed rights to research and conduct preclinical pharmacology activities with a specified combination of

compounds, subject to certain specified conditions. Pursuant to the Asana License Agreement, neither Asana nor ASN can directly or indirectly exploit certain classes of competing products, subject to specified exceptions. In addition, we are required to use commercially reasonable efforts to develop and obtain regulatory approval for ERAS-007 in the United States, at least one major market country in Europe, and either China or Japan.

Under the Asana Merger Agreement, we made an upfront payment of $20 million and issued 4,000,000 shares of our Series B-2 convertible preferred stock to Asana. In connection with our IPO, these shares of Series B-2 convertible preferred stock were converted into 3,333,333 shares of our common stock. We are obligated to make future development and regulatory milestone cash payments for a licensed product in an amount of up to $90 million. Additionally, upon achieving a development milestone related to demonstration of successful proof-of-concept in a specified clinical trial, we will be required to issue 3,888,889 shares of our common stock to Asana. We are not obligated to pay royalties on the net sales of licensed products.

Upon our payment to Asana of all merger consideration, including upfront cash and equity payments, the milestone payments, the equity payment related to the proof-of-concept development milestone, and all other development milestone payments, with the exception of a specific milestone that does not need to be achieved at such time and will remain subject to payment in the event that such milestone occurs at a later time, all licensed rights will become fully paid-up, perpetual, and irrevocable. The License Agreement may be terminated by either Asana or us in the event of an uncured material breach by the other party. Asana also has the right to terminate the Asana License Agreement if we fail to engage in material activities in support of clinical development and commercialization of ERAS-007 for a period of 12 consecutive months, excluding reasons outside of our reasonable control and subject to certain limitations. However, Asana's right to terminate the Asana License Agreement for any reason ends once we have paid to Asana all merger consideration, or if Asana's equity interest in us is publicly traded and exceeds a certain threshold value. We may terminate the Asana License Agreement at any time upon the provision of prior written notice to Asana.

Katmai Pharmaceuticals

In March 2020, we entered into a license agreement (the Katmai Agreement) with Katmai Pharmaceuticals, Inc. (Katmai) under which we were granted an exclusive, worldwide, royalty-bearing license to certain patent rights and know-how controlled by Katmai related to the development of small molecule therapeutic and diagnostic products that modulate EGFR and enable the identification, diagnosis, selection, treatment, and/or monitoring of patients for neuro-oncological applications to develop, manufacture, use, and commercialize ERAS-801 and certain other related compounds in all fields of use. We have the right to sublicense (through multiple tiers) our rights under the Katmai Agreement, subject to certain limitations and conditions, and are required to use commercially reasonable efforts to develop, manufacture, and commercialize licensed products and to meet certain specified development and launch milestones by certain dates. We are obligated to use commercially reasonable efforts to develop the licensed products first for use within the neuro-oncology field before expanding our development efforts to include other indications in the oncology field. Following the first achievement of a clinical proof-of-concept for any indication, we have the right to submit a non-binding offer to Katmai for: (i) the purchase of all licensed patent rights, know-how, and other assets owned by Katmai that are necessary or useful for the exploitation of the licensed products, or (ii) for the purchase of Katmai. Pursuant to the Katmai Agreement, neither Katmai nor we can directly or indirectly exploit certain specified classes of competing products.

The license granted under the Katmai Agreement is subject to The Regents of the University of California's reserved right to: (i) use the licensed patent rights and know-how for educational and non-commercial research purposes, and to publish results arising therefrom, and (ii) grant licenses to the licensed know-how to third parties without notice because the licensed know-how is non-exclusively licensed to Katmai by The Regents of the University of California. Further, the license granted under the Katmai Agreement is subject to the rights of the United States government under the Bayh-Dole Act, including: (i) a non-exclusive, non-transferable, irrevocable, paid-up license to practice or have practiced the invention claimed by the licensed patent rights throughout the world, and (ii) the obligation that any licensed products used or sold in the United States be manufactured substantially in the United States.

Under the Katmai Agreement, we made an upfront payment of $5.7 million and Katmai agreed to purchase shares of our Series B-1 convertible preferred stock and Series B-2 convertible preferred stock having an aggregate value of $2.7 million. In connection with our IPO, these shares of Series B-1 convertible preferred stock and Series B-2 convertible preferred stock were converted into 395,555 shares of our common stock, in the aggregate. We are obligated to make future development and regulatory milestone payments of up to $26 million, of which $2 million was paid in March 2022, and commercial milestone payments of up to $101 million. We are also obligated to pay tiered royalties on net sales of each licensed product, at rates ranging from the mid- to high-single digit percentages, subject to a minimum annual royalty payment in the low six figures and certain permitted deductions.

Our royalty obligations and the Katmai Agreement will expire, on a licensed product-by-licensed product and country-by-country basis, on the earlier of: (i) the ten-year anniversary of the expiration of all valid claims included in the licensed patents covering the composition of matter or method of use of such licensed product in such country, or (ii) the twentieth anniversary of the first commercial sale of such licensed product in such country. Upon the expiration of the Katmai Agreement, we will have a fully paid-up and irrevocable license.

The Katmai Agreement may be terminated in its entirety by either party: (i) in the event of an uncured material breach by the other party, or (ii) in the event the other party becomes subject to specified bankruptcy, insolvency, or similar circumstances. Provided that we are in full compliance with the Katmai Agreement, we may terminate the Katmai Agreement upon written notice to Katmai. Upon termination of the Katmai Agreement for any reason, all rights and licenses granted to us thereunder will terminate. Upon termination of the Katmai Agreement, we are obligated, among other things, to: (i) grant an exclusive license to Katmai under all of our right, title and interest in all inventions and know-how developed under the Katmai Agreement existing at the time of termination that are specific to the licensed compounds or products, including without limitation all data and results related to their exploitation, and (ii) transfer to Katmai ownership and possession of all regulatory filings related to the licensed compounds and products. Unless the Katmai Agreement is terminated for our material breach, the parties will negotiate in good faith the financial terms pursuant to which the foregoing actions will be conducted, provided that our performance of such actions may not be conditioned upon the conduct or completion of such negotiations. If the parties are unable to agree upon such terms within the specified time period, then the parties will submit all unresolved matters for resolution by arbitration.

NiKang Therapeutics

In February 2020, we entered into a license agreement (the NiKang Agreement) with NiKang Therapeutics, Inc. (NiKang) under which we were granted an exclusive, worldwide license to certain intellectual property rights owned or controlled by NiKang related to certain SHP2 inhibitors to develop and commercialize ERAS-601 and certain other related compounds for all applications. We have the right to sublicense (through multiple tiers) our rights under the NiKang Agreement, subject to certain conditions, and are required to use commercially reasonable efforts to develop and commercialize licensed products. The parties are obligated to negotiate in good faith for a certain period of time to grant NiKang the exclusive commercial distribution rights in greater China once a licensed product reaches a certain development stage.

Under the NiKang Agreement, we made an upfront payment of $5 million to NiKang and reimbursed NiKang $0.4 million for certain initial manufacturing costs. In addition, we paid an additional $7 million after publication of a US patent application that covered the composition of matter of ERAS-601. We are also obligated to pay (i) development and regulatory milestone payments in an aggregate amount of up to $16 million for the first licensed product, of which $4.0 million was paid in January 2021, and $12 million for a second licensed product, and (ii) commercial milestone payments in an aggregate amount of up to $157 million for the first licensed product and $151 million for a second licensed product. We are also obligated to: (i) pay tiered royalties on net sales of all licensed products in the mid-single digit percentages, subject to certain reductions; and (ii) equally split net sublicensing revenues earned under sublicense agreements that we enter into with any third party before commencement of the first Phase I clinical trial for a licensed product.

The NiKang Agreement will expire upon the last to expire royalty term, which is determined on a licensed product-by-licensed product and country-by-country basis, and is the later of: (i) ten years from the date of first commercial sale, (ii) the last to expire valid claim within the licensed patent rights covering such licensed product, or (iii) the expiration of all regulatory exclusivity for the licensed product in such country. Upon expiration of the NiKang Agreement, on a licensed product-by-licensed product and country-by-country basis, we will have a fully paid-up, non-exclusive license to conduct research and to develop and commercialize the licensed products.

The NiKang Agreement may be terminated in its entirety by NiKang in the event of our uncured material breach, which includes our failure to use commercially reasonable efforts to satisfy certain specified clinical development diligence milestones. In addition, NiKang may terminate if we, directly or indirectly, commence a legal action challenging the validity or enforceability of any licensed patents. Further, if we acquire more than 50% of the equity or assets of a company that owns a competing small molecule that is designed to prevent the same target as set forth in the NiKang Agreement from switching to an enzymatically active state, then we must either divest such competing product or terminate the NiKang Agreement. We may terminate the NiKang Agreement at any time upon the provision of prior written notice to NiKang. Upon termination of the NiKang Agreement for any reason, all rights and licenses granted to us, as well as any sublicenses that we granted thereunder, will terminate. In addition, upon any termination (but not expiration) of the NiKang Agreement and upon NiKang's request, the parties are obligated to meet and negotiate in good faith the terms of a license

from us to NiKang to allow NiKang's continued development, manufacture, and commercialization of the licensed products.

Emerge Life Sciences

In March 2021, we entered into an asset purchase agreement (the ELS Purchase Agreement) with Emerge Life Sciences, Pte. Ltd. (ELS) wherein we purchased all rights, title, and interest (including all patent and other intellectual property rights) to ELS's EGFR antibodies directed against the EGFR domain II (EGFR-D2) and domain III (EGFR-D3) as well as a bispecific antibody where one arm is directed against EGFR-D2 and the other is directed against EGFR-D3 (the Antibodies). Under the ELS Purchase Agreement, we issued 500,000 shares of our common stock to ELS and made an upfront payment of $2 million. We are not obligated to pay royalties on the net sales of products covered by the acquired intellectual property. Under the ELS Purchase Agreement, ELS is committed to performing certain studies on the Antibodies to assist in development activities, the costs of which shall be mutually agreed upon and for which we will be responsible.

Pursuant to the ELS Purchase Agreement, at any time between 12 months and 36 months after the effective date of the ELS Purchase Agreement, if we reasonably determine that none of the Antibodies should be taken into human clinical trials due to safety, efficacy or CMC issues, then we have the option to select another antibody developed and solely owned by ELS that is not the subject of a license, collaboration, or option to a third party (the Option). If we elect to exercise the Option, then ELS will provide us with a list of all available antibodies that meet the aforementioned requirements, and we have the right to select one antibody from the list. Upon our selection of an antibody, ELS will assign us all rights, title and interest to such antibody (including patent and other intellectual property rights) subject to any pre-existing obligations or restrictions. In the event that we wish to have ELS conduct any studies on such optioned antibody, then after mutual agreement as to the scope of the studies, we will be responsible for the cost for such studies.

Commercialization

We intend to maintain exclusive worldwide development and commercialization rights to our product candidates (excluding programs in our pipeline that arise from an investment made by Erasca Ventures in a third party) and, if marketing approval is obtained, to commence commercialization activities by building a focused sales and marketing organization to sell our products on our own in the United States and potentially other regions such as Europe. We will likely seek commercialization partnerships for our product candidates in other regions beyond the United States and Europe. We currently have no sales, marketing, or commercial product distribution capabilities. We intend to build the necessary infrastructure and capabilities over time for commercialization in the United States and potentially other regions, following further advancement of our product candidates. Clinical data, the size of the addressable patient population, the size of the commercial infrastructure and manufacturing needs, and the status of our pipeline, may all influence or alter our commercialization plans.

Competition + Cooperation ("Coopetition")

Although the biotechnology and pharmaceutical industries, and the oncology sector, are characterized by rapid evolution of technologies, fierce competition, and strong defense of intellectual property rights, we believe the most fearsome competitor of all is cancer itself. As such, we view other companies in this sector more as potential allies and collaborators than as competitors, as we all have a common cause: to defeat cancer. Many of the companies that are developing or marketing treatments for cancer, including major pharmaceutical and biotechnology companies that are working on therapies targeting the RAS/MAPK pathway, are companies with whom we endeavor to collaborate in our mission to erase cancer.

Collaborating with these companies alleviates some of the traditional challenges that emerging companies face with respect to financial resources, established presence in the market, expertise in research and development, manufacturing, preclinical and clinical testing, obtaining regulatory approvals and reimbursement, and marketing approved products. Similarly, recruiting and retaining qualified scientific and management personnel, establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, programs are challenges for all companies developing or marketing treatments for cancer.

That said, our commercial potential could be reduced or eliminated if other companies develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than products that we may develop. Other companies also may obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours, which could result in these companies establishing a strong market position before we are able to enter the market or make our development more complicated.

There are numerous companies developing or marketing treatments for cancer, including many major pharmaceutical and biotechnology companies. These treatments consist of small molecule drug products, biologics, cell-based therapies, and traditional chemotherapy. There are also a number of pharmaceutical companies with product candidates in development that target the nodes involving the RAS/MAPK pathway. These include, among others, Amgen, AstraZeneca, Black Diamond Therapeutics, BioMed Valley Discoveries, Boehringer Ingelheim, BridgeBio, Bristol Myers Squibb, Deciphera Pharmaceuticals, Eli Lilly, Jacobio Pharmaceuticals, Janssen, Merck, Novartis, Pfizer, Revolution Medicines, Roche/Genentech, and Sanofi.

Intellectual property

We strive to protect the proprietary technology, inventions, and improvements that are commercially or strategically important to our business, including seeking, maintaining, and defending patent rights, whether developed internally or in-licensed/acquired from third parties. We also rely on trade secrets and know-how relating to our proprietary technology and product candidates and continuing innovation to develop, strengthen and maintain our proprietary position. We also plan to rely on data exclusivity, market exclusivity and patent term adjustments or extensions when available. Our commercial success will depend in part on our ability to obtain and maintain patent and other intellectual property protection for our proprietary technology, inventions and improvements; to preserve the confidentiality of our trade secrets; to defend and enforce our proprietary rights, including any patents or trademarks that we may own in the future; and to operate without infringing on the valid and enforceable patents and other proprietary rights of third parties. Intellectual property rights may not address all potential threats to our competitive advantage.

We continually assess and refine our intellectual property strategy as we develop new product candidates. To that end, we are prepared to file additional patent applications in any appropriate fields if our intellectual property strategy includes such filings, or where we seek to adapt to competition or seize business opportunities. Further, we are prepared to file patent applications, as we consider appropriate under the circumstances, relating to the new technologies that we develop.

We cannot be sure that patents will be granted with respect to any of our pending patent applications or with respect to any patent applications we may own or license in the future, nor can we be sure that any of our existing patents or any patents we may own or license in the future will be useful in protecting our technology.

As of December 31, 2023, our patent estate for the programs listed below, which consists of owned and in-licensed patent families, includes seventeen issued US patents, twenty-five pending US non-provisional patent applications, eight pending US provisional patent applications, one hundred seventy-seven issued foreign patents, ten pending international patent applications filed under the Patent Cooperation Treaty (PCT application), and two hundred nine pending foreign patent applications in various markets outside of the United States. In particular, we have patents and/or patent applications pending for each of our product candidates.

Naporafenib

As of December 31, 2023, we have in-licensed ten patent families from Novartis. The ten patent families relate to RAF inhibitors, their preparation, and methods of use. One of the families covers the naporafenib product candidate compound and additional RAF inhibitor compounds, their preparation and methods of use, and includes four issued US patents, eighty-six issued foreign patents, and five pending foreign patent applications. The nine additional in-licensed families cover further methods of using naporafenib, diagnostic methods, and additional RAF inhibitor compounds, their preparation and methods of use, and include four issued US patents, six pending US non-provisional applications, two pending PCT patent applications, forty issued foreign patents, and sixty-three pending foreign patent applications. The granted patents and any further patents that issue from applications from the ten in-licensed families are expected to expire between 2034 and 2043, absent any patent term adjustments or extensions.

As of December 31, 2023, we own two patent families relating to naporafenib and their methods of use and include two pending US provisional patent applications, two pending PCT patent applications and two pending foreign patent

applications. Any patents issued from these patent applications are expected to expire in 2044, absent any patent term adjustments or extensions.

ERAS-007

As of December 31, 2023, we have in-licensed three patent families from Asana. The three patent families relate to ERK 1/2 inhibitors, their preparation, and methods of use. One of the families covers the ERAS-007 product candidate compound and additional ERK1/2 inhibitor compounds, their preparation and methods of use, and includes four issued US patents, one pending US non-provisional patent application, forty-six issued foreign patents, and eight pending foreign patent applications. The additional in-licensed families cover methods of using ERAS-007 and include two pending US non-provisional patent applications and twelve pending foreign patent applications. The granted patents and any further patents that issue from applications from the three in-licensed families are expected to expire between 2036 and 2042, absent any patent term adjustments or extensions.

As of December 31, 2023, we also own six patent families relating to ERAS-007. The patent families include five pending US non-provisional patent applications, one pending PCT patent application and thirty-two foreign pending patent applications. Any patents issued from these patent applications are expected to expire between 2042 and 2043, absent any patent term adjustments or extensions.

ERAS-801

As of December 31, 2023, we have sub-licensed four patent families from Katmai, which Katmai in-licensed from the University of California, Los Angeles (UCLA). One of the families covers the ERAS-801 product candidate compound and additional EGFR inhibitor compounds, their preparation and methods of use, and includes one issued US patent, one pending US non-provisional patent application, one issued foreign patent, and twenty-six pending foreign patent applications. The three additional in-licensed families relate to additional EGFR inhibitor compounds, their preparation and methods of use, and include three pending US non-provisional patent applications and ten pending foreign patent applications. The granted patent and any further patents that issue from applications from the four in-licensed patent families are expected to expire between 2038 and 2041, absent any patent term adjustments or extensions.

As of December 31, 2023, we co-own with UCLA one patent family, relating to additional EGFR inhibitor compositions, their preparation and methods of use. This patent family includes one pending US non-provisional patent application. Any patents issued from this application are expected to expire in 2041, absent any patent term adjustments or extensions.

As of December 31, 2023, we own two patent families relating to EGFR inhibitor polymorph forms and methods of using EGFR inhibitor compositions. These patent families include one pending US provisional patent application and one pending PCT patent application. Any patents issued from these applications are expected to expire between 2042 and 2044, absent any patent term adjustments or extensions.

ERAS-601

As of December 31, 2023, we have in-licensed two patent families from NiKang. These two patent families relate to SHP2 inhibitor compositions, their preparation, and methods of use. One of the families covers the ERAS-601 product candidate compound, its preparation and methods of use, and includes three issued US patents, one pending US non-provisional patent application, three issued foreign patents and twenty-three pending foreign patent applications. The second family covers additional SHP2 inhibitor compositions, their preparation and methods of use, and includes one issued US patent application, one issued foreign patent and six pending foreign patent applications. The granted patents and any further patents that issue from applications from the two in-licensed families are expected to expire in 2039, absent any patent term adjustments or extensions.

As of December 31, 2023, we also own six patent families relating to ERAS-601 and their methods of use, and include four pending US non-provisional patent applications, two pending PCT applications and nineteen pending foreign patent applications. Any patents issued from these applications are expected to expire between 2041 and 2042, absent any patent term adjustments or extensions.

ERAS-4

As of December 31, 2023, we own three patent families relating to KRAS inhibitors, their preparation, and methods of use. These patent families include five pending US provisional patent applications, one pending PCT application, and one pending foreign patent application. Any patents issued from these applications are expected to expire between 2042 and 2044, absent any patent term adjustments or extensions.

ERAS-12

As of December 31, 2023, we own two patent families relating to EGFR antibodies, their preparation, and methods of use. The patent families include one pending US non-provisional patent application, one pending PCT patent application and two pending foreign patent applications. Any patents issued from these applications are expected to expire between 2042 and 2043, absent any patent term adjustments or extensions.

Other IP programs or patents

With respect to our product candidates and processes we intend to develop and commercialize in the normal course of business, we intend to pursue patent protection covering, when possible, compositions, methods of use, dosing and formulations. We may also pursue patent protection with respect to manufacturing and drug development processes and technologies. Obtaining and maintaining patent protection depends on compliance with various procedural, document submission, fee payment, and other requirements imposed by governmental patent agencies. We may not be able to obtain patent protections for our compositions, methods of use, dosing and formulations, manufacturing and drug development processes and technologies throughout the world. Issued patents can provide protection for varying periods of time, depending upon the date of filing of the patent application, the date of patent issuance and the legal term of patents in the countries in which they are obtained. In general, patents issued for applications filed in the United States can provide exclusionary rights for 20 years from the earliest effective filing date. In addition, in certain instances, the term of an issued US patent that covers or claims an FDA-approved product can be extended to recapture a portion of the term effectively lost as a result of the FDA regulatory review period, which is called patent term extension. The restoration period cannot be longer than five years and the total patent term, including the restoration period, must not exceed 14 years following FDA approval. The US Patent and Trademark Office (USPTO) may also adjust the term of a US patent to accommodate for delays caused by the USPTO during the prosecution of a US patent application. Congress has defined the conditions upon which an applicant can receive an adjustment to the term and such requirements are established in 35 USC 154(b). Similar provisions are available in Europe and other jurisdictions to extend the term of a patent that covers an approved drug. The term of patents outside of the United States varies in accordance with the laws of the foreign jurisdiction, but typically is also 20 years from the earliest effective filing date. However, the actual protection afforded by a patent varies on a product-by-product basis, from country-to-country, and depends upon many factors, including the type of patent, the scope of its coverage, the availability of regulatory-related extensions, the availability of legal remedies in a particular country, and the validity and enforceability of the patent. Patent terms may be inadequate to protect our competitive position on our products for an adequate amount of time. In the future, if and when our therapeutic candidates receive FDA approval, we expect to apply for patent term extensions on patents covering those therapeutic candidates. We intend to seek patent term extensions in any jurisdiction where these are available and where we also have a patent that may be eligible; however, there is no guarantee that the applicable authorities, including the USPTO and FDA, will agree with our assessment of whether such extensions should be granted, and even if granted, the length of such extensions.

The patent positions of companies like ours are generally uncertain and involve complex legal and factual questions. No consistent policy regarding the scope of claims allowable in patents in the field of biopharmaceuticals has emerged in the United States. The relevant patent laws and their interpretation outside of the United States is also uncertain. Changes in either the patent laws or their interpretation in the United States and other countries may diminish our ability to protect our technology or product candidates and could affect the value of such intellectual property. In particular, our ability to stop third parties from making, using, selling, offering to sell or importing products that infringe our intellectual property will depend in part on our success in obtaining and enforcing patent claims that cover our technology, inventions and improvements. We cannot guarantee that patents will be granted with respect to any of our pending patent applications or with respect to any patent applications we may file in the future, nor can we be sure that any patents that may be granted to us in the future will be commercially useful in protecting our products, the methods of use or manufacture of those products. Moreover, even our issued patents do not guarantee us the right to practice our technology in relation to the commercialization of our products. Patent and other intellectual property rights in the pharmaceutical and biotechnology space are evolving and involve many risks and uncertainties. For example, third parties may have blocking patents that could be used to prevent us from commercializing our product candidates and practicing our proprietary technology, and

our issued patents may be challenged, invalidated or circumvented, which could limit our ability to stop competitors from marketing related products or could limit the term of patent protection that otherwise may exist for our product candidates. In addition, the scope of the rights granted under any issued patents may not provide us with protection or competitive advantages against competitors with similar technology. Furthermore, our competitors may independently develop similar technologies that are outside the scope of the rights granted under any issued patents. For these reasons, we may face competition with respect to our product candidates. Moreover, because of the extensive time required for development, testing and regulatory review of a potential product, it is possible that, before any particular product candidate can be commercialized, any patent protection for such product may expire or remain in force for only a short period following commercialization, thereby reducing the commercial advantage the patent provides.

We also rely on trade secrets to protect aspects of our technology and business not amenable to, or that we do not consider appropriate for, patent protection. We seek to protect this intellectual property, in part, by requiring our employees, consultants, outside scientific collaborators, sponsored researchers and other service providers and advisors to execute confidentiality agreements upon the commencement of employment or other relationship with us. In general, these agreements provide that confidential information concerning our business or financial affairs developed or made known to the individual during the course of the individual's relationship with us is to be kept confidential and not disclosed to third parties except in specific circumstances. In the case of employees, the agreements further provide that inventions and discoveries conceived or reduced to practice by the individual that are related to our business, or actual, or demonstrably anticipated, research or development, or made during normal working hours, on our premises or using our equipment, supplies, or proprietary information, are our exclusive property. In many cases our agreements with consultants, outside scientific collaborators, sponsored researchers and other service providers and advisors require them to assign, or grant us licenses to, inventions resulting from the work or services they render under such agreements or grant us an option to negotiate a license to use such inventions.

We seek trademark protection in the United States and in certain other jurisdictions where available and when we deem appropriate. We currently have an issued United States trademark for our "ERASCA" mark and have registrations for such mark pending in foreign jurisdictions, including the European Union. We have also filed a trademark application in the United States as well as foreign jurisdictions, including the European Union, for registration of our "MAPKLAMP" mark.

Manufacturing

We do not own or operate, and currently have no plans to establish, any manufacturing facilities. We rely, and expect to continue to rely, on third parties for the manufacture of our product candidates for preclinical and clinical testing, as well as for commercial manufacture if any of our product candidates obtain marketing approval. We are working with our current manufacturers to ensure that we will be able to scale up our manufacturing capabilities to support our clinical plans. We are also in the process of locating and qualifying additional manufacturers to build redundancies into our supply chain. In addition, we rely on third parties to package, label, store, and distribute our product candidates, and we intend to continue to rely on third parties with respect to our commercial products if marketing approval is obtained. We believe that this strategy allows us to maintain a more efficient infrastructure by eliminating the need for us to invest in our own manufacturing facilities, equipment, and personnel while also enabling us to focus our expertise and resources on the design and development of our product candidates.

Government Regulation

The FDA and comparable regulatory authorities in state and local jurisdictions and in other countries impose substantial and burdensome requirements upon companies involved in the clinical development, manufacture, marketing and distribution of drugs and biologics such as those we are developing. These entities regulate, among other things, the research and development, testing, manufacture, quality control, safety, effectiveness, labeling, storage, record keeping, approval, advertising and promotion, distribution, post-approval monitoring and reporting, sampling and export and import of our product candidates.

US regulation of drugs and biologics

In the United States, the FDA regulates drugs under the Federal Food, Drug, and Cosmetic Act (FDCA), and its implementing regulations, and biologics under the FDCA and the Public Health Service Act and their implementing regulations. FDA approval of a NDA or biologics license application (BLA) or supplement is required before any new unapproved drug, biologic or dosage form, including a new use of a previously approved drug or biologic, can be marketed in the United States.

The process required by the FDA before such product candidates may be marketed in the United States generally involves the following:

- completion of extensive preclinical laboratory tests and preclinical animal studies, certain of which must be performed in accordance with applicable Good Laboratory Practice (GLP) regulations;
- submission to the FDA of an investigational new drug application (IND) which must become effective before human clinical trials may be initiated and must be updated annually;
- approval by an independent institutional review board (IRB) or ethics committee representing each clinical site before each clinical trial can be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with Good Clinical Practice (GCP) requirements to establish the safety and efficacy, or with respect to biologics, the safety, purity and potency of the product candidate for each proposed indication;
- preparation of and submission to the FDA of an NDA or BLA, after completion of all pivotal clinical trials;
- potential review of the product application by an FDA advisory committee, where appropriate and if applicable;
- a determination by the FDA within 60 days of its receipt of an NDA or BLA to file the application for review;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facilities where the proposed product drug substance is produced to assess compliance with current Good Manufacturing Practice requirements (cGMPs) and audits of selected clinical trial sites to ensure compliance with GCP; and
- FDA review and approval of an NDA or BLA prior to any commercial marketing or sale of the drug in the United States.

Preclinical studies include laboratory evaluation of product chemistry, toxicity and formulation, as well as *in vitro* and animal studies to assess potential safety and efficacy. The conduct of preclinical studies is subject to federal regulations and requirements, including GLP regulations applicable to certain safety/toxicology studies.

An IND is a request for allowance from the FDA to administer an investigational drug product to humans. The central focus of an IND submission is on the general investigational plan and the protocol or protocols for preclinical studies and clinical trials. The IND also includes results of animal and in vitro studies assessing the toxicology, pharmacokinetics, pharmacology and pharmacodynamic characteristics of the product, chemistry, manufacturing and controls (CMC) information, and any available human data or literature to support the use of the investigational product. An IND must become effective before human clinical trials may be initiated. The IND automatically becomes effective 30 days after receipt by the FDA, unless the FDA, within the 30-day period, raises safety concerns or questions about the proposed clinical trial. In such a case, the IND may be placed on clinical hold and the IND sponsor and the FDA must resolve any outstanding concerns or questions before the clinical trial can be initiated. Submission of an IND therefore may or may not result in FDA allowance to initiate a clinical trial.

Clinical trials involve the administration of the investigational product to human subjects under the supervision of qualified investigators in accordance with GCP, which, among other things, includes the requirement that all research subjects, or their legal representative, provide their informed consent for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the inclusion and exclusion criteria, the objectives of the trial, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. A separate submission to the existing IND must be made for each successive clinical trial conducted during product development and for any subsequent protocol amendments. While the IND is active, progress reports summarizing the results of the clinical trials and nonclinical studies performed since the last progress report, among other things, must be submitted at least annually to the FDA, and written IND safety reports must be submitted to the FDA and investigators for serious and unexpected suspected adverse events, findings from other studies suggesting a significant risk to humans exposed to the same or similar drugs or biologics, findings from animal or *in vitro* testing suggesting a significant risk to humans, and any clinically

important increased incidence of a serious suspected adverse reaction compared to that listed in the protocol or investigator brochure.

Furthermore, an independent IRB for each site proposing to conduct the clinical trial must review and approve the plan for any clinical trial and its informed consent form before the clinical trial initiates at that site, and must monitor the trial until completed. An IRB is charged with protecting the welfare and rights of trial participants and considers such items as whether the risks to individuals participating in the clinical trials are minimized and are reasonable in relation to anticipated benefits. Regulatory authorities, the IRB or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the subjects are being exposed to an unacceptable health risk or that the trial is unlikely to meet its stated objectives. Some trials also include oversight by an independent group of qualified experts organized by the clinical trial sponsor, known as a data safety monitoring board or committee, which provides authorization for whether or not a trial may move forward at designated check points based on access to certain data from the trial and may recommend that the clinical trial be halted if it determines that there is an unacceptable safety risk for subjects or other grounds, such as no demonstration of efficacy. There are also requirements governing the reporting of clinical trials and clinical trial results to public registries.

The clinical investigation of a drug is generally divided into three phases. Although the phases are usually conducted sequentially, they may overlap or be combined.

- ***Phase 1***: The investigational product is initially introduced into healthy human subjects or patients with the target disease or condition. These trials are designed to test the safety, dosage tolerance, absorption, metabolism and distribution of the investigational product in humans, the side effects associated with increasing doses, and, if possible, to gain early evidence on effectiveness.
- ***Phase 2***: The investigational product is administered to a limited patient population with a specified disease or condition to evaluate the preliminary efficacy, optimal dosages and dosing schedule and to identify possible adverse side effects and safety risks. Multiple Phase 2 clinical trials may be conducted to obtain information prior to beginning larger and more expensive Phase 3 clinical trials.
- ***Phase 3***: The investigational product is administered to an expanded patient population to further evaluate dosage, to provide statistically significant evidence of clinical efficacy and to further test for safety, generally at multiple geographically dispersed clinical trial sites. These clinical trials are intended to establish the overall risk/benefit ratio of the investigational product and to provide an adequate basis for labeling.

Post-marketing trials, sometimes referred to as Phase 4 clinical trials, may be conducted after initial marketing approval. These clinical trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication. In certain instances, such as with accelerated approval drugs, the FDA may mandate the performance of Phase 4 clinical trials as a condition of approval.

Concurrent with clinical trials, companies may complete additional animal studies and develop additional information about the biological characteristics of the product candidate, and must finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, must develop methods for testing the identity, strength, quality and purity of the final product, or for biologics, the safety, purity and potency.

In addition, during the development of a new drug or biologic, sponsors are given opportunities to meet with the FDA at certain points. These points may be prior to submission of an IND, at the end of Phase 2, and before an NDA or BLA is submitted. Meetings at other times may be requested. These meetings can provide an opportunity for the sponsor to share information about the data gathered to date, for the FDA to provide advice, and for the sponsor and the FDA to reach agreement on the next phase of development.

NDA and BLA review process

Assuming successful completion of all required testing in accordance with all applicable regulatory requirements, the results of product development, including results from nonclinical studies and clinical trials are submitted to the FDA as part of an NDA or BLA requesting approval to market the product for one or more indications. The submission of an NDA or BLA requires payment of a substantial application user fee to the FDA, unless a waiver or exemption applies.

The NDA or BLA must include all relevant data available from pertinent preclinical studies and clinical trials, including negative or ambiguous results as well as positive findings, together with detailed information relating to the product's CMC and proposed labeling, among other things. Data can come from company-sponsored clinical trials intended to test the safety and effectiveness of the product, or from a number of alternative sources, including trials initiated and sponsored by investigators.

In addition, under the Pediatric Research Equity Act (PREA), an NDA or BLA or supplement to an NDA or BLA must contain data to assess the safety and effectiveness of the biological product candidate for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The Food and Drug Administration Safety and Innovation Act requires that a sponsor who is planning to submit a marketing application for a drug or biological product that includes a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration submit an initial pediatric trial plan within sixty days after an end-of-Phase 2 meeting or as may be agreed between the sponsor and FDA. Unless otherwise required by regulation, PREA does not apply to any drug or biological product for an indication for which orphan designation has been granted.

Within 60 days following submission of the application, the FDA reviews the submitted BLA or NDA to determine if the application is substantially complete before the agency accepts it for filing. The FDA may refuse to file any NDA or BLA that it deems incomplete or not properly reviewable at the time of submission and may request additional information. In this event, the NDA or BLA must be resubmitted with the additional information. Once an NDA or BLA has been accepted for filing, the FDA's goal is to review standard applications within ten months after the filing date, or, if the application qualifies for priority review, six months after the FDA accepts the application for filing. In both standard and priority reviews, the review process may also be extended for a three-month period by the FDA to review additional information deemed a major amendment to the application. Once accepted for filing, the FDA reviews an NDA to determine, among other things, whether a product is safe and effective for its intended use and whether its manufacturing is sufficient to assure and preserve the product's identity, strength, quality and purity. The FDA reviews a BLA to determine, among other things, whether a product is safe, pure and potent and the facility in which it is manufactured, processed, packed or held meets standards designed to assure the product's continued safety, purity and potency. When reviewing an NDA or BLA, the FDA may convene an advisory committee to provide clinical insight on application review questions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

Before approving an NDA or BLA, the FDA will typically inspect the facility or facilities where the product is manufactured. The FDA will not approve an application unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. Additionally, before approving an NDA or BLA, the FDA may inspect one or more clinical sites to assure compliance with GCP.

After the FDA evaluates the NDA or BLA and conducts inspections of manufacturing facilities where the investigational product and/or its drug substance will be produced, the FDA may issue an approval letter or a Complete Response Letter (CRL). An approval letter authorizes commercial marketing of the product with specific prescribing information for specific indications. A CRL signals that the review cycle is complete and the application cannot be approved in its present form. The CRL will generally describe all of the deficiencies that the FDA has identified in the NDA or BLA, except that where the FDA determines that the data supporting the application are inadequate to support approval, the FDA may issue the CRL without first conducting any required inspections, testing submitted product lots and/or reviewing proposed labeling. In issuing the CRL, the FDA may recommend actions that the applicant might take to place a resubmitted NDA or BLA in condition for approval, including requests for additional data, information or clarification. The FDA may delay or refuse approval of an NDA or BLA if applicable regulatory criteria are not satisfied, require additional testing or information and/or require post-marketing testing and surveillance to monitor safety or efficacy of a product.

If regulatory approval of a product is granted, such approval will be granted for particular indications and may entail limitations on the indicated uses for which such product may be marketed. For example, the FDA may approve the NDA or BLA with a Risk Evaluation and Mitigation Strategy (REMS) to ensure the benefits of the product outweigh its risks. A REMS is a safety strategy to manage a known or potential serious risk associated with a product and to enable patients to have continued access to such medicines by managing their safe use, and could include medication guides, physician communication plans, or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. The FDA also may condition approval on, among other things, changes to proposed labeling or the development of adequate controls and specifications. The FDA may also require one or more Phase 4 post-market trials and additional surveillance to further assess and monitor the product's safety and effectiveness after commercialization, and may limit further marketing of the product based on the results of these post-marketing trials.

Expedited development and review programs

The FDA offers a number of expedited development and review programs for qualifying product candidates. For example, the fast track program is intended to expedite or facilitate the process for reviewing product candidates that meet certain criteria. Specifically, product candidates are eligible for FTD if they are intended to treat a serious or life-threatening disease or condition and demonstrate the potential to address unmet medical needs for the disease or condition. FTD applies to the combination of the product candidate and the specific indication for which it is being studied. The sponsor of a fast track product candidate has opportunities for more frequent interactions with the review team during product development and, once an NDA or BLA is submitted, the application may be eligible for priority review, if the relevant criteria are met. An NDA or BLA for a fast track product candidate may also be eligible for rolling review, where the FDA may consider for review sections of the NDA or BLA on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the NDA or BLA, the FDA agrees to accept sections of the NDA or BLA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the NDA or BLA.

A product candidate intended to treat a serious or life-threatening disease or condition may also be eligible for breakthrough therapy designation to expedite its development and review. A product candidate can receive breakthrough therapy designation if preliminary clinical evidence indicates that the product candidate, alone or in combination with one or more other drugs or biologics, may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. The designation includes all of the fast track program features, as well as more intensive FDA interaction and guidance beginning as early as Phase 1 and an organizational commitment to expedite the development and review of the product candidate, including involvement of senior managers.

Any marketing application for a drug or biologic submitted to the FDA for approval, including a product candidate with a fast track designation and/or breakthrough therapy designation, may be eligible for other types of FDA programs intended to expedite the FDA review and approval process, such as priority review. An NDA or BLA is eligible for priority review if the product candidate has the potential to provide a significant improvement in the treatment, diagnosis or prevention of a serious disease or condition. For new molecular entity NDAs and original BLAs, priority review designation means the FDA's goal is to take action on the marketing application within six months of the 60-day filing date (as compared to 10 months under standard review).

Additionally, depending on the design of the applicable clinical trials, product candidates studied for their safety and effectiveness in treating serious or life-threatening diseases or conditions may receive accelerated approval upon a determination that the product candidate has an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments. As a condition of accelerated approval, the FDA will generally require the sponsor to perform adequate and well-controlled confirmatory clinical trials to verify and describe the anticipated effect on irreversible morbidity or mortality or other clinical benefit, and may require that such confirmatory trials are underway prior to granting any accelerated approval. Products receiving accelerated approval may be subject to expedited withdrawal procedures if the sponsor fails to conduct the required confirmatory trials in a timely manner or if such trials fail to verify the predicted clinical benefit. In addition, the FDA currently requires as a condition for accelerated approval pre-approval of promotional materials, which could adversely impact the timing of the commercial launch of the product.

Fast track designation, breakthrough therapy designation, priority review, and accelerated approval do not change the standards for approval but may expedite the development or approval process. Even if a product qualifies for one or more of these programs, the FDA may later decide that the product no longer meets the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

Orphan drug designation

Under the Orphan Drug Act, the FDA may grant ODD to a drug or biologic intended to treat a rare disease or condition, which is a disease or condition that affects fewer than 200,000 individuals in the United States, or more than 200,000 individuals in the United States for which there is no reasonable expectation that the cost of developing and making available in the United States a drug or biologic for this type of disease or condition will be recovered from sales in the United States for that drug or biologic. ODD must be requested before submitting an NDA or BLA. After the FDA grants ODD, the generic identity of the therapeutic agent and its potential orphan use are disclosed publicly by the FDA. The ODD does not convey any advantage in, or shorten the duration of, the regulatory review or approval process.

If a product candidate that has ODD subsequently receives the first FDA approval for the disease or condition for which it has such designation, the product is entitled to orphan drug exclusive approval (or exclusivity), which means that the FDA may not approve any other applications, including a full NDA or BLA, to market the same drug or biologic for the same disease or condition for seven years, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity or if the FDA finds that the holder of the orphan drug exclusivity has not shown that it can assure the availability of sufficient quantities of the orphan drug to meet the needs of patients with the disease or condition for which the drug or biologic was designated. Orphan drug exclusivity does not prevent the FDA from approving a different drug or biologic for the same disease or condition, or the same drug or biologic for a different disease or condition. Among the other benefits of orphan drug designation are tax credits for certain research and a waiver of the NDA or BLA application user fee.

A designated orphan drug may not receive orphan drug exclusivity if it is approved for a use that is broader than the disease or condition for which it received ODD. In addition, exclusive marketing rights in the United States may be lost if the FDA later determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantities of the product to meet the needs of patients with the rare disease or condition.

Post-approval requirements

Any products manufactured or distributed pursuant to FDA approvals are subject to pervasive and continuing regulation by the FDA, including, among other things, requirements relating to record-keeping, reporting of adverse experiences, periodic reporting, product sampling and distribution, and advertising and promotion of the product. After approval, most changes to the approved product, such as adding new indications or other labeling claims, are subject to prior FDA review and approval. There also are continuing user fee requirements, under which the FDA assesses an annual program fee for each product identified in an approved NDA or BLA. Drug and biologic manufacturers and their subcontractors are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMPs, which impose certain procedural and documentation requirements upon us and our third-party manufacturers. Changes to the manufacturing process are strictly regulated, and, depending on the significance of the change, may require prior FDA approval before being implemented. FDA regulations also require investigation and correction of any deviations from cGMPs and impose reporting requirements upon us and any third-party manufacturers that we may decide to use. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain compliance with cGMPs and other aspects of regulatory compliance.

The FDA may withdraw approval if compliance with regulatory requirements and standards is not maintained or if problems occur after the product reaches the market. Later discovery of previously unknown problems with a product, including adverse events of unanticipated severity or frequency, or with manufacturing processes, or failure to comply with regulatory requirements, may result in revisions to the approved labeling to add new safety information; imposition of post-market trials or clinical trials to assess new safety risks; or imposition of distribution restrictions or other restrictions under a REMS program. Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of a product, complete withdrawal of the product from the market or product recalls;
- fines, warning letters or holds on post-approval clinical trials;
- refusal of the FDA to approve pending applications or supplements to approved applications, or suspension or revocation of existing product approvals;
- product seizure or detention, or refusal of the FDA to permit the import or export of products;
- consent decrees, corporate integrity agreements, debarment or exclusion from federal healthcare programs;
- mandated modification of promotional materials and labeling and the issuance of corrective information;
- injunctions or the imposition of civil or criminal penalties.

The FDA closely regulates the marketing, labeling, advertising and promotion of drug products. A company can make only those claims relating to safety and efficacy, purity and potency that are approved by the FDA 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. Failure to comply with these requirements can result in, among other things, adverse publicity, warning letters, corrective advertising and potential civil and criminal penalties. Physicians may prescribe, in their independent professional medical judgment, legally available products for uses that are not described in the product's labeling and that differ from those approved by the FDA. Physicians may believe that such off-label uses are the best treatment for many patients in varied circumstances. The FDA does not regulate the behavior of physicians in their choice of treatments. The FDA does, however, restrict manufacturer's communications on the subject of off-label use of their products. The federal government has levied large civil and criminal fines against companies for alleged improper promotion of off-label use and has enjoined companies from engaging in off-label promotion. The FDA and other regulatory agencies have also required that companies enter into consent decrees or permanent injunctions under which specified promotional conduct is changed or curtailed. However, companies may share truthful and not misleading information that is otherwise consistent with a product's FDA-approved labeling.

In addition, the distribution of prescription biopharmaceutical products is subject to the Prescription Drug Marketing Act (PDMA) which regulates the distribution of drugs and drug samples at the federal level, and sets minimum standards for the registration and regulation of drug distributors by the states. Both the PDMA and state laws limit the distribution of prescription pharmaceutical product samples and impose requirements to ensure accountability in distribution.

Drug product marketing exclusivity

Market exclusivity provisions under the FDCA can delay the submission or the approval of certain marketing applications. For example, the FDCA provides a five-year period of non-patent data exclusivity within the United States to the first applicant to obtain approval of an NDA for a new chemical entity. A drug is a new chemical entity if the FDA has not previously approved any other new drug containing the same active moiety, which is the molecule or ion responsible for the action of the drug substance. During the exclusivity period, the FDA may not approve or even accept for review an abbreviated new drug application (ANDA), or an NDA submitted under Section 505(b)(2), or 505(b) (2) NDA, submitted by another company for another drug based on the same active moiety, regardless of whether the drug is intended for the same indication as the original innovative drug or for another indication, where the applicant does not own or have a legal right of reference to all the data required for approval. However, an application may be submitted after four years if it contains a certification of patent invalidity or non-infringement to one of the patents listed with the FDA by the innovator NDA holder.

The FDCA alternatively provides three years of non-patent exclusivity for an NDA, or supplement to an existing NDA if new clinical investigations, other than bioavailability trials, that were conducted or sponsored by the applicant are deemed by the FDA to be essential to the approval of the application, for example new indications, dosages or strengths of an existing drug. This three-year exclusivity covers only the modification for which the drug received approval on the basis of the new clinical investigations and does not prohibit the FDA from approving ANDAs or 505(b)(2) NDAs for drugs containing the active agent for the original indication or condition of use. Five-year and three-year exclusivity will not delay the submission or approval of a full NDA. However, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to any preclinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and effectiveness.

Pediatric exclusivity is another type of marketing exclusivity available in the United States. Pediatric exclusivity provides for an additional six months of marketing exclusivity attached to another existing period of regulatory exclusivity or patent term if a sponsor conducts clinical trials in children in response to a Written Request from the FDA. The issuance of a written request does not require the sponsor to undertake the described clinical trials. In addition, orphan drug exclusivity, as described above, may offer a seven-year period of marketing exclusivity, except in certain circumstances.

Biosimilars and reference product exclusivity

The Biologics Price Competition and Innovation Act of 2009 (BPCIA) created an abbreviated approval pathway for biological products that are highly similar, or “biosimilar,” to or interchangeable with an FDA-approved reference biological product. Biosimilarity, which requires that there be no clinically meaningful differences between the biological product and the reference product in terms of safety, purity, and potency, is generally shown through analytical studies, animal studies, and a clinical trial or trials. Interchangeability requires that a product is biosimilar to the reference product and the product must demonstrate that it can be expected to produce the same clinical results as the reference product in any given patient and, for products that are administered multiple times to an individual, the biologic and the reference biologic may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic. A product shown to be biosimilar or interchangeable with an FDA-approved reference biological product may rely in part on the FDA’s previous determination of safety and effectiveness for the reference product for approval, which can potentially reduce the cost and time required to obtain approval to market the product.

Under the BPCIA, an application for a biosimilar product may not be submitted to the FDA until four years following the date that the reference product was first licensed by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first licensed. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA for the competing product containing that applicant’s own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of its product. The BPCIA also created certain exclusivity periods for biosimilars approved as interchangeable products. At this juncture, it is unclear whether products deemed “interchangeable” by the FDA will, in fact, be readily substituted by pharmacies, which are governed by state pharmacy law.

A biological product can also obtain pediatric market exclusivity in the United States, as described above, if the BLA sponsor voluntarily completes a pediatric study that fairly responds to a "written request" from the FDA to conduct such study.

FDA regulation of companion diagnostics

If safe and effective use of a drug or biologic depends on an *in vitro* diagnostic, then the FDA may require approval or clearance of that diagnostic, known as a companion diagnostic, at the same time that the FDA approves the therapeutic product. In August 2014, the FDA issued final guidance clarifying the requirements that will apply to approval of therapeutic products and in vitro companion diagnostics. According to the guidance, if FDA determines that a companion diagnostic device is essential to the safe and effective use of a novel therapeutic product or indication, FDA may will not approve the drug or new indication if the companion diagnostic device is not also approved or cleared for that indication. Approval or clearance of the companion diagnostic device will ensure that the device has been adequately evaluated and has adequate performance characteristics in the intended population. The review of *in vitro* companion diagnostics in conjunction with the review of our product candidates will, therefore, likely involve coordination of review by the FDA’s Center for Drug Evaluation and Research or the FDA’s Center for Biologics Evaluation and Research and the FDA’s Center for Devices and Radiological Health Office of In Vitro Diagnostics and Radiological Health.

Under the FDCA, *in vitro* diagnostics, including companion diagnostics, are regulated as medical devices. In the United States, the FDCA and its implementing regulations, and other federal and state statutes and regulations govern, among other things, medical device design and development, preclinical and clinical testing, premarket clearance or approval, registration and listing, manufacturing, labeling, storage, advertising and promotion, sales and distribution, export and import, and post-market surveillance. Unless an exemption applies, diagnostic tests require marketing clearance or approval from the FDA prior to commercial distribution. The two primary types of FDA marketing authorization applicable to a medical device are clearance of a premarket notification pursuant to Section 510(k) of the FDCA, also called 510(k) clearance, and approval of a premarket approval application (PMA).

The PMA process, including the gathering of clinical and preclinical data and the submission to and review by the FDA, can take several years or longer. It involves a rigorous premarket review during which the applicant must prepare and provide the FDA with reasonable assurance of the device's safety and effectiveness and information about the device and its components regarding, among other things, device design, manufacturing and labeling. PMA applications are subject to an application fee. In addition, PMAs for certain devices must generally include the results from extensive preclinical and adequate and well-controlled clinical trials to establish the safety and effectiveness of the device for each indication for which FDA approval is sought. As part of the PMA review, the FDA will typically inspect the manufacturer's facilities for compliance with the Quality System Regulation (QSR) which imposes elaborate testing, control, documentation and other quality assurance requirements.

If the FDA's evaluation of the PMA application is favorable, the FDA typically issues an approvable letter requiring the applicant's agreement to specific conditions, such as changes in labeling, or specific additional information, such as submission of final labeling, in order to secure final approval of the PMA. If the FDA's evaluation of the PMA or manufacturing facilities is not favorable, the FDA will deny approval of the PMA or issue a not approvable letter. A not approvable letter will outline the deficiencies in the application and, where practical, will identify what is necessary to make the PMA approvable. The FDA may also determine that additional clinical trials are necessary, in which case the PMA approval may be delayed for several months or years while the trials are conducted and then the data submitted in an amendment to the PMA. If the FDA concludes that the applicable criteria have been met, the FDA will issue a PMA for the approved indications, which can be more limited than those originally sought by the applicant. The PMA can include post-approval conditions that the FDA believes necessary to ensure the safety and effectiveness of the device, including, among other things, restrictions on labeling, promotion, sale and distribution. Once granted, PMA approval may be withdrawn by the FDA if compliance with post-approval requirements, conditions of approval or other regulatory standards are not maintained or problems are identified following initial marketing.

After a device is placed on the market, it remains subject to significant regulatory requirements. Medical devices may be marketed only for the uses and indications for which they are cleared or approved. Device manufacturers must also establish registration and device listings with the FDA. A medical device manufacturer's manufacturing processes and those of its suppliers are required to comply with the applicable portions of the QSR, which cover the methods and documentation of the design, testing, production, processes, controls, quality assurance, labeling, packaging and shipping of medical devices. Domestic facility records and manufacturing processes are subject to periodic unscheduled inspections by the FDA. The FDA also may inspect foreign facilities that export products to the United States.

Other US regulatory requirements

In addition to FDA regulation of pharmaceutical products, pharmaceutical companies are also subject to additional healthcare regulation and enforcement by the federal government and by authorities in the states and foreign jurisdictions in which they conduct their business and may constrain the financial arrangements and relationships through which we research, as well as sell, market and distribute any products for which we obtain marketing authorization. Such laws include, without limitation, state and federal anti-kickback, fraud and abuse, false claims, and transparency laws and regulations related to drug pricing and payments and other transfers of value made to physicians and other healthcare providers. If their operations are found to be in violation of any of such laws or any other governmental regulations that apply, they may be subject to penalties, including, without limitation, administrative, civil and criminal penalties, damages, fines, disgorgement, the curtailment or restructuring of operations, integrity oversight and reporting obligations, exclusion from participation in federal and state healthcare programs and imprisonment.

US coverage and reimbursement

Significant uncertainty exists as to the coverage and reimbursement status of any product candidate for which we may seek regulatory approval. Sales in the United States will depend, in part, on the availability of sufficient coverage and adequate reimbursement from third-party payors, which include government health programs such as Medicare, Medicaid, TRICARE and the Veterans Administration, as well as managed care organizations and private health insurers. Prices at which we or our customers seek reimbursement for our product candidates can be subject to challenge, reduction or denial by third-party payors.

The process for determining whether a third-party payor will provide coverage for a product is typically separate from the process for setting the reimbursement rate that the payor will pay for the product. In the United States, there is no uniform policy among payors for coverage or reimbursement. Decisions regarding whether to cover any of a product, the extent of coverage and amount of reimbursement to be provided are made on a plan-by-plan basis. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own coverage and reimbursement policies, but also have their own methods and approval processes. Therefore, coverage and reimbursement for products can differ significantly from payor to payor. As a result, the coverage determination process is often a time-consuming and costly process that can require manufacturers to provide scientific and clinical support for the use of a product to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance. In addition, companion diagnostic tests require coverage and reimbursement separate and apart from the coverage and reimbursement for their companion pharmaceutical or biological products. Similar challenges to obtaining coverage and reimbursement, applicable to pharmaceutical or biological products, will apply to companion diagnostics.

Third-party payors are increasingly challenging the price and examining the medical necessity and cost-effectiveness of medical products and services, in addition to their safety and efficacy. Third-party payors may not consider our product candidates to be medically necessary or cost-effective compared to other available therapies. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit sales of any product that receives approval.

US healthcare reform

In the United States, there have been, and continue to be, legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of product candidates, restrict or regulate post-approval activities, and affect the profitable sale of product candidates. Among policy makers and payors in the United States, there is significant interest in promoting changes in healthcare systems with the stated goals of containing healthcare costs, improving quality and/or expanding access. In the United States, the pharmaceutical industry has been a particular focus of these efforts and has been significantly affected by major legislative initiatives.

By way of example, in March 2010, the Patient Protection and Affordable Care Act (the ACA) was passed, which substantially changed the way healthcare is financed by both governmental and private insurers, and significantly affected the pharmaceutical industry. The ACA, among other things, increased the minimum level of Medicaid rebates payable by manufacturers of brand name drugs from 15.1% to 23.1% of the average manufacturer price; required collection of rebates for drugs paid by Medicaid managed care organizations; required manufacturers to participate in a coverage gap discount program, in which manufacturers must agree to offer point-of-sale discounts off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D; imposed a non-deductible annual fee on pharmaceutical manufacturers or importers who sell certain "branded prescription drugs" to specified federal government programs; implemented a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted, or injected; expanded eligibility criteria for Medicaid programs; creates a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in, and conduct comparative clinical effectiveness research, along with funding for such research; and established a Center for Medicare and Medicaid Innovation at the Centers for Medicare & Medicaid Services (CMS) to test innovative payment and service delivery models to lower Medicare and Medicaid spending, potentially including prescription drug spending.

Since its enactment, there have been judicial, executive and political challenges to certain aspects of the ACA. On June 17, 2021, the US Supreme Court dismissed a challenge on procedural grounds that argued the ACA is unconstitutional in its entirety because the "individual mandate" was repealed by Congress. Thus, the ACA will remain in effect in its current form. Prior to the US Supreme Court ruling, President Biden issued an executive order that initiated initiate a special enrollment period from February 15, 2021 through August 15, 2021 for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructed certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA.

In addition, other legislative changes have been proposed and adopted since the ACA was enacted. These changes included aggregate reductions to Medicare payments to providers, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, will remain in effect through 2032, with the exception of a temporary suspension from May 1, 2020 through March 31, 2022, unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. In addition, on March 11, 2021, the American Rescue Plan Act of 2021 was signed into law, which eliminated the statutory Medicaid drug rebate cap, beginning January 1, 2024. The rebate was previously capped at 100% of a drug's average manufacturer price.

Moreover, there has recently been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several Congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for pharmaceutical products. On August 16, 2022, the Inflation Reduction Act of 2022, or IRA, was enacted into law. Among other things, the IRA requires manufacturers of certain drugs to engage in price negotiations with Medicare (beginning in 2026), imposes rebates under Medicare Part B and Medicare Part D to penalize price increases that outpace inflation (first due in 2023), and replaces the Part D coverage gap discount program with a new discounting program (beginning in 2025). The IRA permits the Secretary of the Department of Health and Human Services to implement many of these provisions through guidance, as opposed to regulation, for the initial years. On August 29, 2023, the US Department of Health and Human Services (HHS) announced the list of the first ten drugs that will be subject to price negotiations. HHS has issued and will continue to issue guidance implementing the IRA, although the Medicare drug price negotiation program is currently subject to legal challenges. While the impact of the IRA on the pharmaceutical industry cannot yet be fully determined, it is likely to be significant.

Individual states in the United States have also become increasingly active in implementing regulations designed to control pharmaceutical 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, designed to encourage importation from other countries and bulk purchasing. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine which drugs and suppliers will be included in their healthcare programs Furthermore, there has been increased interest by third party payors and governmental authorities in reference pricing systems and publication of discounts and list prices.

We expect that additional state and federal healthcare reform measures will be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare product candidates and services, which could result in reduced demand for our product candidates once approved or additional pricing pressures.

EU drug regulation

In order to market any product outside of the United States, we would need to comply with numerous and varying regulatory requirements of other countries and jurisdictions regarding quality, safety and efficacy and governing, among other things, clinical trials, marketing authorization, commercial sales and distribution of our products. Whether or not we obtain FDA approval for a product, we would need to obtain the necessary approvals by the comparable foreign regulatory authorities before we can commence clinical trials or marketing of the product in foreign countries and jurisdictions such as in China and Japan. Although many of the issues discussed above with respect to the United States apply similarly in the context of the European Union (EU), the approval process varies between countries and jurisdictions and can involve additional product testing and additional administrative review periods. The time required to obtain approval in other countries and jurisdictions might differ from and be longer than that required to obtain FDA approval. Regulatory approval in one country or jurisdiction does not ensure regulatory approval in another, but a failure or delay in obtaining regulatory approval in one country or jurisdiction may negatively impact the regulatory process in others. Failure to comply with applicable foreign regulatory requirements, may be subject to, among other things, fines, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, operating restrictions and criminal prosecution.

Non-clinical studies and clinical trials

Similarly to the United States, the various phases of non-clinical and clinical research in the EU are subject to significant regulatory controls.

Non-clinical studies are performed to demonstrate the health or environmental safety of new chemical or biological substances. Non-clinical studies must be conducted in compliance with the principles of good laboratory practice (GLP) as set forth in EU Directive 2004/10/EC. In particular, non-clinical studies, both in vitro and in vivo, must be planned, performed, monitored, recorded, reported and archived in accordance with the GLP principles, which define a set of rules and criteria for a quality system for the organizational process and the conditions for non-clinical studies. These GLP standards reflect the Organization for Economic Co-operation and Development requirements.

Clinical trials of medicinal products in the EU must be conducted in accordance with EU and national regulations and the International Conference on Harmonization (ICH) guidelines on GCP as well as the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki. Additional GCP guidelines from the European Commission, focusing in particular on traceability, apply to clinical trials of advanced therapy medicinal products. If the sponsor of the clinical trial is not established within the EU, it must appoint an entity within the EU to act as its legal representative. The sponsor must take out a clinical trial insurance policy, and in most EU member states, the sponsor is liable to provide 'no fault' compensation to any trial subject injured in the clinical trial.

Certain countries outside of the United States, including the EU, have a similar process that requires the submission of a clinical trial application (CTA) much like the IND prior to the commencement of human clinical trials. A CTA must be submitted to each country's national health authority and an independent ethics committee, much like the FDA and the IRB, respectively. Once the CTA is approved by the national health authority and the ethics committee has granted a positive opinion in relation to the conduct of the trial in the relevant member state(s), in accordance with a country's requirements, clinical trial development may proceed.

The CTA must include, among other things, a copy of the trial protocol and an investigational medicinal product dossier containing information about the manufacture and quality of the medicinal product under investigation. Currently, CTAs must be submitted to the competent authority in each EU member state in which the trial will be conducted. Under the new Regulation on Clinical Trials, which is currently expected to become applicable by early 2022, there will be a centralized application procedure where one national authority takes the lead in reviewing the application and the other national authorities have only a limited involvement. Any substantial changes to the trial protocol or other information submitted with the CTA must be notified to or approved by the relevant competent authorities and ethics committees. Medicines used in clinical trials must be manufactured in accordance with good manufacturing practice (GMP). Other national and EU-wide regulatory requirements also apply.

Marketing Authorizations

To market a medicinal product in the EU and in many other foreign jurisdictions, we must obtain separate regulatory approvals. More concretely, in the EU, medicinal product candidates can only be commercialized after obtaining a Marketing Authorization (MA). To obtain regulatory approval of an investigational medicinal product under EU regulatory systems, we must submit a marketing authorization application (MAA.) The process for doing this depends, among other things, on the nature of the medicinal product. There are two types of MAs:

- the "Union MA", which is issued by the European Commission through the Centralized Procedure, based on the opinion of the Committee for Medicinal Products for Human Use (CHMP) of the European Medicines Agency (EMA) and which is valid throughout the entire territory of the EU. The Centralized Procedure is mandatory for certain types of products, such as: (i) medicinal products derived from biotechnology medicinal products, (ii) designated orphan medicinal products, (iii) advanced therapy products (such as gene therapy, somatic cell therapy or tissue-engineered medicines), and (iv) medicinal products containing a new active substance indicated for the treatment certain diseases, such as HIV/AIDS, cancer, neurodegenerative diseases, diabetes, other auto-immune and viral diseases. The Centralized Procedure is optional for products containing a new active substance not yet authorized in the EU, or for products that constitute a significant therapeutic, scientific or technical innovation or that the granting of authorization would be in the interest of public health in the EU; and
- "National MAs", which are issued by the competent authorities of the EU member states and only cover their respective territory, are available for products not falling within the mandatory scope of the Centralized Procedure. Where a product has already been authorized for marketing in an EU member state, this National MA can be recognized in another member state through the Mutual Recognition Procedure. If the product has not received a National MA in any member state at the time of application, it can be approved simultaneously in various member states through the Decentralized Procedure. Under the Decentralized Procedure an identical dossier is submitted to the competent authorities of each of the member states in which the MA is sought, one of which is selected by the applicant as the Reference member state.

Under the above-described procedures, in order to grant the MA, the EMA or the competent authorities of the EU member states make an assessment of the risk-benefit balance of the product on the basis of scientific criteria concerning its quality, safety and efficacy.

Under the Centralized Procedure, the maximum timeframe for the evaluation of a MAA by the EMA is 210 days. Where there is a major public health interest and an unmet medical need for a product, the CHMP may perform an accelerated review of a MA in no more than 150 days (not including clock stops). Innovative products that target an unmet medical need and are expected to be of major public health interest may be eligible for a number of expedited development and review programs, such as the PRIME scheme, which provides incentives similar to the breakthrough therapy designation in the US PRIME is a voluntary scheme aimed at enhancing the EMA's support for the development of medicines that target unmet medical needs. It is based on increased interaction and early dialogue with companies developing promising medicines, to optimize their product development plans and speed up their evaluation to help them reach patients earlier. Product developers that benefit from PRIME designation can expect to be eligible for accelerated assessment but this is not guaranteed. The benefits of a PRIME designation include the appointment of a CHMP rapporteur before submission of a MAA, early dialogue and scientific advice at key development milestones, and the potential to qualify products for accelerated review earlier in the application process.

MAs have an initial duration of five years. After these five years, the authorization may be renewed for an unlimited period on the basis of a reevaluation of the risk-benefit balance, unless the EMA decides, on justified grounds relating to pharmacovigilance, to mandate one additional five-year renewal period.

Data and marketing exclusivity

The EU also provides opportunities for market exclusivity. Upon receiving MA, new chemical entity, or reference product candidates, generally receive eight years of data exclusivity and an additional two years of market exclusivity. If granted, the data exclusivity period prevents generic or biosimilar applicants from relying on the pre-clinical and clinical trial data contained in the dossier of the reference product when applying for a generic or biosimilar MA in the EU during a period of eight years from the date on which the reference product was first authorized in the EU. The market exclusivity period prevents a successful generic or biosimilar applicant from commercializing its product in the EU until 10 years have elapsed from the initial authorization of the reference product in the EU. The overall 10-year market exclusivity period can be extended to a maximum of eleven years if, during the first eight years of those 10 years, the MA holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to their authorization, are held to bring a significant clinical benefit in comparison with existing therapies. However, there is no guarantee that a product will be considered by the EU's regulatory authorities to be a new chemical entity, and products may not qualify for data exclusivity.

Pediatric Development

In the EU, MAAs for new medicinal products candidates have to include the results of trials conducted in the pediatric population, in compliance with a pediatric investigation plan (PIP) agreed with the EMA's Pediatric Committee (PDCO). The PIP sets out the timing and measures proposed to generate data to support a pediatric indication of the drug for which MA is being sought. The PDCO can grant a deferral of the obligation to implement some or all of the measures of the PIP until there is sufficient data to demonstrate the efficacy and safety of the product in adults. Further, the obligation to provide pediatric clinical trial data can be waived by the PDCO when these data is not needed or appropriate because the product is likely to be ineffective or unsafe in children, the disease or condition for which the product is intended occurs only in adult populations, or when the product does not represent a significant therapeutic benefit over existing treatments for pediatric patients. Once the MA is obtained in all EU Member States and trial results are included in the product information, even when negative, the product is eligible for six months' supplementary protection certificate extension (if any is in effect at the time of authorization).

Post-Approval Requirements

Similar to the United States, both MA holders and manufacturers of medicinal products are subject to comprehensive regulatory oversight by the EMA, the European Commission and/or the competent regulatory authorities of the member states. The holder of a MA must establish and maintain a pharmacovigilance system and appoint an individual qualified person for pharmacovigilance who is responsible for oversight of that system. Key obligations include expedited reporting of suspected serious adverse reactions and submission of periodic safety update reports (PSURs).

All new MAA must include a risk management plan (RMP) describing the risk management system that the company will put in place and documenting measures to prevent or minimize the risks associated with the product. The regulatory authorities may also impose specific obligations as a condition of the MA. Such risk-minimization measures or post-authorization obligations may include additional safety monitoring, more frequent submission of PSURs, or the conduct of additional clinical trials or post-authorization safety trials.

The advertising and promotion of medicinal products is also subject to laws concerning promotion of medicinal products, interactions with physicians, misleading and comparative advertising and unfair commercial practices. All advertising and promotional activities for the product must be consistent with the approved summary of product characteristics, and therefore all off-label promotion is prohibited. Direct-to-consumer advertising of prescription medicines is also prohibited in the EU. Although general requirements for advertising and promotion of medicinal products are established under EU directives, the details are governed by regulations in each member state and can differ from one country to another.

The aforementioned EU rules are generally applicable in the European Economic Area (EEA) which consists of the 27 EU member states plus Norway, Liechtenstein and Iceland.

For other countries outside of the EU, such as countries in Latin America or Asia (e.g., China and Japan), the requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement vary from country to country. In all cases, again, the clinical trials are conducted in accordance with GCP and the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki. If we fail to comply with applicable foreign regulatory requirements, we may be subject to, among other things, fines, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, operating restrictions and criminal prosecution.

Data Privacy and Security Laws

Numerous state, federal and foreign laws, regulations and standards govern the collection, use, access to, confidentiality and security of health-related and other personal information, and could apply now or in the future to our operations or the operations of our partners. In the United States, numerous federal and state laws and regulations, including data breach notification laws, health information privacy and security laws and consumer protection laws and regulations govern the collection, use, disclosure, and protection of health-related and other personal information. In addition, certain foreign laws govern the privacy and security of personal data, including health-related data. Privacy and security laws, regulations, and other obligations are constantly evolving, may conflict with each other to complicate compliance efforts, and can result in investigations, proceedings, or actions that lead to significant civil and/or criminal penalties and restrictions on data processing.

Japanese drug regulation

Non-clinical studies and clinical trials

Being a member of the International Conference on Harmonization (ICH), Japan has pharmaceutical regulations fundamentally similar to those of the United States or EU.

Non-clinical studies are performed to demonstrate the health safety of new chemical or biological substances. Non-clinical studies must be conducted in compliance with the principles of Japanese good laboratory practice (GLP) which reflect the Organization for Economic Co-operation and Development requirements. Currently, Japan and EU have a mutual recognition agreement for GLP, and data generated compliant with EU requirements will be accepted by the Japanese authorities. There is no similar agreement with the United States.

Clinical trials of medicinal products in Japan must be conducted in accordance with Japanese regulations based on ICH guidelines governing good clinical practices (GCP). They focus on ethics of the clinical trial and protection of the privacy of the trial subjects. If the sponsor of the clinical trial is not established within Japan, it must appoint an entity within the country to act as its caretaker who should be authorized to act on the sponsor’s behalf. The sponsor must take out a clinical trial insurance policy, and, according to the industry agreement, should put in place a common compensation policy for the injuries from the trial.

Prior to the commencement of human clinical trials, the sponsor must complete evaluation of the safety of the investigative product, and submit a clinical trial notification and the protocol to the authorities in advance, upon agreement of the IRB of the participating institutions. When the authorities do not comment on the notification, the sponsor may proceed with the clinical trial.

Any substantial changes to the trial protocol or other information submitted must be cleared by the IRB and notified to the authorities. Medicines used in clinical trials must be manufactured in accordance with good manufacturing practice (GMP).

Product approval

To market a medicinal product in Japan, we must obtain regulatory approval. To obtain regulatory approval of an investigational medicinal product, we must submit a new drug application. The process for doing this depends, among other things, on the nature of the medicinal product and there are currently a few different pathways for approval. If the product is designed for treating certain “difficult diseases” or those whose patient size is limited, we may be able to obtain designation as an orphan drug product if it demonstrates unique therapeutic value. Approval application for such designated orphan products will be processed on an expedited basis and the authorities’ requirement for clinical data will be much limited. Separately, the latest amendment to the law introduced separate pathways for: (i) truly innovative products with a unique mode of action, and (ii) those which will satisfy unmet medical needs. These products will also be processed on an expedited basis.

The evaluation of applications will be based on an assessment of the risk-benefit balance of the product on the basis of scientific criteria concerning its quality, safety and efficacy. Once the review organization completes its review task, the matter will be considered by the advisory committee of experts, and the government will grant approval upon positive recommendation from the committee.

The volume and quality of the clinical data will be the key determinant of the approval decision. Clinical trial data generated overseas will be accepted as part of the data package consistent with the ICH recommendation. Typically, a limited dose response clinical trial for Japanese subjects is required to ensure that data are extrapolatable for the Japanese population. In a more recent development, the authorities encourage manufacturers to organize an international joint clinical trial with some Japanese participation under a joint protocol, to expedite the clinical trial process. Regulatory approval does not expire.

Licensing requirement

Separate from the approval requirement, it is also mandatory to possess a distribution license of an appropriate class for the manufacturer to commercially distribute the product in Japan. Non-Japanese companies who possess only the product approval may designate an appropriate license holder in Japan to commercially distribute the product, rather than distributing it on its own. The license is valid for 5 years.

Facilities

Our corporate headquarters is located in San Diego, California, where we lease 77,828 square feet of office and laboratory space pursuant to a lease that expires in April 2032 and may be terminated early under certain circumstances. In January 2024, we entered into an agreement to sublease 10,000 square feet of such office space with a sublease term of three years, which includes an option for the subtenant to renew for an additional year and an early termination clause.

We also lease 29,542 square feet of office and laboratory space in South San Francisco, California, pursuant to a lease that expires in October 2032, with an option to extend the term by 5 years, subject to certain conditions.

We believe our existing facilities are adequate to meet our current business requirements for the near term, and that additional space will be available on commercially reasonable terms, if required.

Employees

As of February 29, 2024, we had 126 full-time employees (FTEs), 45 of whom have doctorate degrees. Of our FTEs, 90 are engaged in research and development activities, and 36 are engaged in general and administrative activities. The majority of our employees are located in San Diego County, California. None of our employees are represented by labor unions or covered by collective bargaining units. We consider our relationship with our employees to be good.

Our human resources objectives include, as applicable, identifying, recruiting, retaining, incentivizing, and integrating our existing and additional employees. The principal purposes of our equity incentive plans are to attract, retain, and motivate selected employees, consultants, and directors through the granting of stock-based compensation awards.

Corporate Information

We were incorporated under the laws of the State of Delaware on July 2, 2018 as Erasca, Inc. Our principal executive offices are located at 3115 Merryfield Row, Suite 300, San Diego, California 92121, and our telephone number is 858-465-6511. Our website address is www.erasca.com. Our website and the information contained on, or that can be accessed through, the website will not be deemed to be incorporated by reference in, and are not considered part of, this Annual Report on Form 10-K.

We are an "emerging growth company" as defined in the Jumpstart Our Business Startups Act of 2012. We will remain an emerging growth company until the earlier of: (i) the last day of the fiscal year: (a) following the fifth anniversary of the completion of the IPO, (b) in which we have total annual gross revenue of at least $1.235 billion, or (c) in which we are deemed to be a large accelerated filer, which means the market value of our common stock that is held by non-affiliates exceeds $700.0 million as of the prior June 30th, and (ii) the date on which we have issued more than $1.0 billion in nonconvertible debt during the prior three-year period.

Available Information

Our website address is www.erasca.com. Our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, including exhibits, proxy and information statements and amendments to those reports filed or furnished pursuant to Sections 13(a), 14, and 15(d) of the Exchange Act are available through the “Investors” portion of our website free of charge as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. In addition, our filings with the SEC may be accessed through the SEC’s Interactive Data Electronic Applications system at www.sec.gov. All statements made in any of our securities filings, including all forward-looking statements or information, are made as of the date of the document in which the statement is included, and we do not assume or undertake any obligation to update any of those statements or documents unless we are required to do so by law.

We use the “Investors” portion of our website as a means of disclosing material non-public information and for complying with our disclosure obligations under Regulation FD. Investors should monitor such website, in addition to following our press releases, SEC filings and public conference calls and webcasts. Information relating to our corporate governance is also included on our website. The information in or accessible through the SEC and our website are not incorporated into, and are not considered part of, this Annual Report on Form 10-K.

Item 1A. Risk Factors.

Investing in our common stock involves a high degree of risk. You should carefully consider the risks and uncertainties described below, as well as the other information in this Annual Report on Form 10-K, including our consolidated financial statements and the related notes included elsewhere in this Annual Report on Form 10-K and "Management's Discussion and Analysis of Financial Condition and Results of Operations," before making investment decisions regarding our common stock. The occurrence of any of the events or developments described below could harm our business, financial condition, results of operations and prospects. In such an event, the market price of our common stock could decline and you may lose all or part of your investment. The risks described below are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may impair our business operations.

Risks related to our limited operating history, financial position and need for additional capital

We have a limited operating history, have incurred significant operating losses since our inception and expect to incur significant losses for the foreseeable future. We may never generate any revenue or become profitable or, if we achieve profitability, we may not be able to sustain it.

We are a clinical-stage biopharmaceutical company with a limited operating history upon which you can evaluate our business and prospects. We commenced operations in 2018, and to date, we have focused primarily on organizing and staffing our company, business planning, raising capital, identifying, acquiring and in-licensing our product candidates, establishing our intellectual property portfolio, conducting research, preclinical studies and clinical trials, establishing arrangements with third parties for the manufacture of our product candidates and related raw materials, and providing general and administrative support for these operations. Our scientific approach to the discovery and development of product candidates is unproven, and we do not know whether we will be able to develop or obtain regulatory approval for any products of commercial value. In addition, while Novartis previously completed a Phase 2 clinical trial for naporafenib, our remaining product candidates are in early clinical development or in the preclinical or discovery stage. We have not yet completed any later-stage, large-scale or pivotal clinical trials, obtained regulatory approvals, manufactured a commercial-scale product, or arranged for a third party to do so on our behalf, or conducted sales and marketing activities necessary for successful product commercialization. Consequently, any predictions made about our future success or viability may not be as accurate as they could be if we had a history of successfully developing and commercializing biopharmaceutical products.

We have incurred significant operating losses since our inception and expect to incur significant losses for the foreseeable future. We do not have any products approved for sale and have not generated any revenue since our inception. If we are unable to successfully develop and obtain requisite approval for our product candidates, we may never generate any revenue. Our net losses were $125.0 million and $242.8 million for the years ended December 31, 2023 and 2022, respectively. As of December 31, 2023, we had an accumulated deficit of $606.0 million. Substantially all of our losses have resulted from expenses incurred in connection with our research and development programs and from general and administrative costs associated with our operations. All of our product candidates will require substantial additional development time and resources before we would be able to apply for or receive regulatory approvals and begin generating revenue from product sales. We expect to continue to incur losses for the foreseeable future, and we anticipate these losses will increase substantially as we continue our development of, seek regulatory approval for and potentially commercialize any of our product candidates and seek to identify, assess, acquire, in-license or develop additional product candidates.

To become and remain profitable, we must succeed in developing and eventually commercializing products that generate significant revenue. This will require us to be successful in a range of challenging activities, including completing clinical trials and preclinical studies of our product candidates, discovering, acquiring or in-licensing additional product candidates, obtaining regulatory approval for these product candidates, and manufacturing, marketing, and selling any products for which we may obtain regulatory approval. We are only in the preliminary stages of most of these activities. We may never succeed in these activities and, even if we do, may never generate revenue that is significant enough to achieve profitability. In addition, we have not yet demonstrated an ability to successfully overcome many of the risks and uncertainties frequently encountered by companies in new and rapidly evolving fields, particularly in the biopharmaceutical industry. Because of the numerous risks and uncertainties associated with biopharmaceutical product development, we are unable to accurately predict the timing or amount of increased expenses or when, or if, we will be able to achieve profitability. Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis. Our failure to become and remain profitable may have an adverse effect on the value of our company and could impair our ability to raise capital, expand our business, maintain our research and development

efforts, diversify our product candidates, or even continue our operations. A decline in the value of our company could also cause you to lose all or part of your investment.

We will require substantial additional capital to finance our operations, and a failure to obtain this necessary capital when needed on acceptable terms, or at all, could force us to delay, limit, reduce or terminate our development programs, commercialization efforts or other operations.

The development of biopharmaceutical product candidates is capital-intensive. Our operations have consumed substantial amounts of cash since inception. We expect our expenses to increase in connection with our ongoing activities, particularly as we conduct our ongoing and planned clinical trials and preclinical studies, and seek regulatory approval for our current product candidates and any future product candidates we may develop or otherwise acquire. In addition, as our product candidates progress through development and toward commercialization, we will need to make milestone payments to the licensors and other third parties from whom we have in-licensed or acquired our product candidates, including naporafenib, ERAS-007, ERAS-801, and ERAS-601. If we obtain regulatory approval for any of our product candidates, we also expect to incur significant commercialization expenses related to product manufacturing, marketing, sales, and distribution. Because the outcome of any clinical trial or preclinical study is highly uncertain, we cannot reasonably estimate the actual amounts necessary to successfully complete the development and commercialization of our product candidates. Furthermore, we expect to incur additional costs associated with operating as a public company. Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. If we are unable to raise capital when needed or on attractive terms, we could be forced to delay, reduce or eliminate our research and development programs or any future commercialization efforts.

Based on our current operating plan, we believe that our existing cash, cash equivalents and marketable securities will be sufficient to fund our operations into the first half of 2026. We have based these estimates on assumptions that may prove to be wrong, and we could use our capital resources sooner than we currently expect. Our operating plans and other demands on our cash resources may change as a result of many factors currently unknown to us, and we may need to seek additional funds sooner than planned, through public or private equity or debt financings or other capital sources, including potential collaborations, licenses and other similar arrangements. In addition, we may seek additional capital due to favorable market conditions or liquidity or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. For example, in August 2022, we entered into an Open Market Sale Agreement (the Sale Agreement) with Jefferies LLC (the Agent), pursuant to which we may, from time to time, sell shares of our common stock having an aggregate offering price of up to $200 million through the Agent. However, there can be no assurance that the Agent will be successful in consummating future sales based on prevailing market conditions or in the quantities or at the prices that we deem appropriate. In addition, the Sale Agreement may be terminated by us or the Agent at any time upon specified notice to the other party, or by the Agent at any time in certain circumstances, including the occurrence of a material adverse change. Attempting to secure additional financing may divert our management from our day-to-day activities, which may adversely affect our ability to develop our product candidates.

Our future capital requirements will depend on many factors, including, but not limited to:

- the type, number, scope, progress, expansions, results, costs and timing of discovery, preclinical studies and clinical trials of our product candidates that we are pursuing or may choose to pursue in the future, including the costs of any third-party products used in our combination clinical trials that are not covered by such third party or other sources;
- the costs and timing of manufacturing for our product candidates with contract manufacturing organizations (CMOs), including commercial manufacturing, if any product candidate is approved;
- the costs, timing and outcome of regulatory review of our product candidates;
- the costs of obtaining, maintaining and enforcing our patents and other intellectual property rights;
- our efforts to enhance operational systems and hire additional personnel to satisfy our obligations as a public company, including enhanced internal controls over financial reporting;
- the costs associated with hiring additional personnel, consultants, and contract research organizations (CROs) as our preclinical and clinical activities increase;
- the timing and amount of the milestone or other payments we must make to the licensors and other third parties from whom we have in-licensed or acquired our product candidates;
- the costs and timing of establishing or securing sales and marketing capabilities if any product candidate is approved;

- our ability to achieve sufficient market acceptance, coverage and adequate reimbursement from third-party payors and adequate market share and revenue for any approved products;
- patients' willingness to pay out-of-pocket for any approved products in the absence of coverage and/or adequate reimbursement from third-party payors;
- any delays and cost increases that result from geopolitical or economic events;
- the terms and timing of establishing and maintaining collaborations, licenses and other similar arrangements; and
- costs associated with any products or technologies that we may in-license or acquire.

Conducting clinical trials and preclinical studies and identifying potential product candidates is a time-consuming, expensive and uncertain process that takes years to complete, and we may never generate the necessary data or results required to obtain regulatory approval and commercialize our product candidates. In addition, our product candidates, if approved, may not achieve commercial success. Our commercial revenue, if any, will be derived from sales of products that we do not expect to be commercially available for many years, if at all.

Accordingly, we will need to continue to rely on additional financing to achieve our business objectives. Adequate additional financing may not be available to us on acceptable terms, or at all, including as a result of financial and credit market deterioration or instability, market-wide liquidity shortages, geopolitical events or otherwise.

Raising additional capital may cause dilution to our stockholders, restrict our operations or require us to relinquish rights to our technologies or product candidates.

Until such time, if ever, as we can generate substantial product revenue, we expect to finance our cash needs through equity offerings, debt financings, or other capital sources, including potential collaborations, licenses and other similar arrangements. We do not have any committed external source of funds. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. Such restrictions could adversely impact our ability to conduct our operations and execute our business plan.

If we raise additional funds through future collaborations, licenses and other similar arrangements, we may have to relinquish valuable rights to our future revenue streams, research programs or product candidates, or grant licenses on terms that may not be favorable to us and/or that may reduce the value of our common stock. If we are unable to raise additional funds through equity or debt financings or other arrangements when needed or on terms acceptable to us, we would be required to delay, limit, reduce, or terminate our product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Our portfolio of investments or bank deposits may be subject to market, interest and credit risk that may reduce their value and adversely affect our business, results of operations and financial condition.

The value of our investments may decline due to interest rate changes, downgrades of the bonds and other securities included in our investment portfolio and instability in the global financial markets that reduces the liquidity of securities included in our portfolio. In addition, future adverse developments with respect to financial institutions or the broader financial services industry may impair our ability to access capital needed to support near-term working capital needs, whether from our existing investment and deposit accounts or otherwise, and may lead to market-wide liquidity shortages and create additional market and economic uncertainty. Furthermore, a possible recession, rising inflation, and ongoing geopolitical events have and may continue to adversely affect the financial markets in some or all countries worldwide. Each of these events may cause us to record charges to reduce the carrying value of our investment portfolio or sell investments for less than our acquisition cost. Although we attempt to mitigate these risks through diversification of our investments, the value of our investments may nevertheless decline, and our ability to fund our near-term and long-term working capital needs to support our business and clinical development plans may be adversely affected. In addition, any decline in available funding or access to our cash and liquidity resources could also result in breaches of our financial and/or contractual obligations or result in violations of federal or state wage and hour laws.

Risks related to the discovery, development and regulatory approval of our product candidates

We are early in our development efforts. If we are unable to successfully develop, obtain regulatory approval and ultimately commercialize any of our current or future product candidates, or experience significant delays in doing so, our business will be materially harmed.

We are early in our development efforts with ERAS-007 and ERAS-801 in early clinical development. In addition, while Novartis has conducted clinical trials for naporafenib, we have yet to complete any clinical trials for this product candidate. As a result, our assumptions about naporafenib's development potential are based in large part on the data generated from such trials conducted by Novartis and we may observe materially and adversely different results as we conduct our planned clinical trials. All of our other programs are still in the preclinical or discovery stage. Our ability to generate product revenue, which we do not expect will occur for many years, if ever, will depend heavily on the successful development and eventual commercialization of our product candidates. The success of our product candidates will depend on several factors, including the following:

- initiation and successful enrollment of clinical trials and timely completion of clinical trials and preclinical studies with favorable results;
- allowance to proceed with clinical trials under INDs by the FDA, or under similar regulatory submissions by comparable foreign regulatory authorities for the conduct of clinical trials of our product candidates and our proposed design of future clinical trials;
- the frequency and severity of adverse events in clinical trials;
- maintaining and establishing relationships with CROs and clinical sites for the clinical development of our product candidates both in the United States and internationally;
- demonstrating the safety, purity, potency and efficacy of our product candidates to the satisfaction of applicable regulatory authorities;
- receipt of marketing approvals from applicable regulatory authorities, including NDAs and BLAs from the FDA and maintaining such approvals;
- making arrangements with our third-party manufacturers for, or establishing, commercial manufacturing capabilities;
- establishing sales, marketing and distribution capabilities and launching commercial sales of our products, if and when approved, whether alone or in collaboration with others;
- establishing and maintaining patent and trade secret protection or regulatory exclusivity for our product candidates;
- maintaining an acceptable safety profile of our products following approval, if any; and
- maintaining and growing an organization of people who can develop and commercialize our products and technology.

If we are unable to develop, obtain regulatory approval for, or, if approved, successfully commercialize our product candidates, we may not be able to generate sufficient revenue to continue our business.

Our scientific approach to the discovery and development of product candidates is unproven, and we do not know whether we will be able to develop any products of commercial value, or if competing approaches will limit the commercial value of our product candidates.

The success of our business depends primarily upon our ability to identify, develop and commercialize products based on our scientific approach, which is singularly focused on shutting down the RAS/MAPK pathway, a novel and unproven approach. While we have had favorable preclinical study results for certain of our development programs, we have not yet succeeded and may not succeed in demonstrating efficacy and safety for any product candidates in clinical trials or in obtaining marketing approvals from the FDA or other regulatory authorities or in commercializing such product candidates. ERAS-007 and ERAS-801 are in early clinical development. In addition, while Novartis has conducted clinical trials for naporafenib, we have yet to complete any clinical trials for this product candidate. In addition, while we believe our pipeline will yield multiple additional INDs for our development programs in the future, we may not be successful in our discovery efforts, and even if successful, we may not be able to submit INDs and have such INDs accepted to enable us to commence clinical trials on the timelines we expect, if at all. Our research methodology and scientific approach may be

unsuccessful in identifying additional product candidates, and any product candidates may be shown to have harmful side effects or may have other characteristics that may necessitate additional clinical testing, or make the product candidates unmarketable or unlikely to receive marketing approval. In particular, using multiple agents to shut down multiple nodes of the RAS/MAPK pathway simultaneously is a novel approach that may have unexpected consequences, including adverse events that preclude successful development and approval of our product candidates. Further, because all of our current product candidates and development programs are based on the RAS/MAPK pathway, adverse developments with respect to one of our programs may have a significant adverse impact on the actual or perceived likelihood of success and value of our other programs.

In addition, the biotechnology and biopharmaceutical industries are characterized by rapidly advancing technologies. Our future success will depend in part on our ability to maintain a competitive position with our scientific approach. If we fail to stay at the forefront of technological change in utilizing our approach to create and develop product candidates, we may be unable to compete effectively. Our competitors may render our approach obsolete, or limit the commercial value of our products or product candidates by advances in existing technological approaches or the development of new or different approaches, potentially eliminating the advantages in our drug discovery process that we believe we derive from our approach. By contrast, adverse developments with respect to other companies that attempt to use a similar approach to our approach may adversely impact the actual or perceived value and potential of our product candidates.

If any of these events occur, we may be forced to delay, modify, or abandon our development efforts for a program or programs, which would have a material adverse effect on our business and could potentially cause us to cease operations.

Clinical and preclinical development involves a lengthy and expensive process with an uncertain outcome, and the results of preclinical studies and early clinical trials are not necessarily predictive of future results. Any of our product candidates may not have favorable results in clinical trials, if any, or receive regulatory approval on a timely basis, if at all.

Clinical and preclinical development is expensive and can take many years to complete, and its outcome is inherently uncertain. We cannot guarantee that any clinical trials or preclinical studies will be conducted as planned or completed on schedule, if at all, and failure can occur at any time during the preclinical study or clinical trial process, including due to factors that are beyond our control. Further, we may not be able to meet expected timeframes for data readouts, such as those for our SEACRAFT clinical trials, HERKULES clinical trial or our THUNDERBBOLT clinical trial. Despite promising preclinical or clinical results, any product candidate can unexpectedly fail at any stage of preclinical or clinical development. The historical failure rate for product candidates in our industry is high.

The results from preclinical studies or clinical trials of a product candidate or a competitor's product candidate in the same class may not predict the results of later clinical trials of our product candidate, and interim, topline, or preliminary results of a clinical trial are not necessarily indicative of final results. In addition, clinical trial data across separate trials may not be directly comparable due to differences in trial protocols, conditions and patient populations. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy characteristics despite having progressed through preclinical studies and initial clinical trials. In particular, while naporafenib was evaluated in several clinical trials that we believe demonstrated PoC or preliminary PoC in certain proposed indications prior to our in-licensing the compound, and in May 2023, we announced encouraging preliminary data for the ERAS-007 combination with encorafenib and cetuximab (EC) in patients with EC-naïve BRAFm colorectal cancer (CRC), we do not know how any of these product candidates will perform in our planned clinical trials, whether due to design differences, patient population or otherwise. For these reasons and others, we do not know whether our product candidates will perform in ongoing or future clinical trials as they have performed in prior trials and studies or in preliminary or interim data readouts for ongoing trials. It is not uncommon to observe results in clinical trials that are unexpected based on preclinical studies and early clinical trials, and many product candidates fail in clinical trials despite very promising early results. If unexpected observations or toxicities are observed for any of our development programs, such results may delay or prevent the initiation of clinical trials for such development programs. Moreover, preclinical and clinical data may be susceptible to varying interpretations and analyses. A number of companies in the biopharmaceutical and biotechnology industries have suffered significant setbacks in clinical development even after achieving promising results in earlier studies. Such setbacks have occurred and may occur for many reasons, including, but not limited to: clinical sites and investigators may deviate from clinical trial protocols, whether due to lack of training or otherwise, and we may fail to detect any such deviations in a timely manner; patients may fail to adhere to any required clinical trial procedures, including any requirements for post-treatment follow-up; our product candidates may fail to demonstrate effectiveness or safety in certain patient subpopulations, which has not been observed in earlier trials due to limited sample size, lack of analysis or otherwise; or our clinical trials may not adequately represent the patient populations we intend to treat, whether due to limitations in our trial designs or otherwise,

such as where one patient subgroup is overrepresented in the clinical trial. There can be no assurance that we will not suffer similar setbacks despite the data we observed in earlier or ongoing studies. Based upon negative or inconclusive results, we or any future collaborator may decide, or regulators may require us, to conduct additional preclinical studies or clinical trials, which would cause us to incur additional operating expenses and delays and may not be sufficient to support regulatory approval on a timely basis or at all.

For the foregoing reasons, we cannot be certain that our ongoing and planned clinical trials and preclinical studies will be successful. Any safety concerns observed in any one of our clinical trials in our targeted indications could limit the prospects for regulatory approval of our product candidates in those and other indications, which could have a material adverse effect on our business, financial condition and results of operations.

Any difficulties or delays in the commencement or completion, or termination or suspension, of our current or planned clinical trials could result in increased costs to us, delay or limit our ability to generate revenue and adversely affect our commercial prospects.

Before obtaining marketing approval from regulatory authorities for the sale of our product candidates, we must conduct extensive clinical studies to demonstrate the safety, purity, potency and efficacy of the product candidates in humans. Before we can initiate clinical trials for our preclinical product candidates, we must submit the results of preclinical studies to the FDA or comparable foreign regulatory authorities along with other information, including information about product candidate chemistry, manufacturing and controls and our proposed clinical trial protocol, as part of an IND application or similar regulatory submission. The FDA or comparable foreign regulatory authorities may require us to conduct additional preclinical studies for any product candidate before it allows us to initiate clinical trials under any IND or similar regulatory submission, which may lead to delays and increase the costs of our preclinical development programs. Moreover, even if these trials begin, issues may arise that could cause regulatory authorities to suspend or terminate such clinical trials. Any delays in the commencement or completion of our ongoing and planned clinical trials for our current and any future product candidate could significantly affect our product development timelines and product development costs.

We do not know whether our planned trials will begin on time or if our ongoing or future clinical trials will be completed on schedule, if at all. The commencement, data readouts and completion of clinical trials can be delayed for a number of reasons, including delays related to:

- inability to generate sufficient preclinical, toxicology, or other in vivo or in vitro data to support the initiation or continuation of clinical trial;
- obtaining regulatory allowances or authorizations to commence a trial or reaching a consensus with regulatory authorities on trial design;
- the FDA or comparable foreign regulatory authorities disagreeing as to the design or implementation of our clinical studies;
- any failure or delay in reaching an agreement with CROs and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- delays in identifying, recruiting and training suitable clinical investigators;
- obtaining approval from one or more IRBs at clinical trial sites;
- IRBs refusing to approve, suspending or terminating the trial at an investigational site, precluding enrollment of additional subjects, or withdrawing their approval of the trial;
- changes to the clinical trial protocol;
- clinical sites deviating from the trial protocol or dropping out of a trial;
- failure by us or our CROs to perform in accordance with GCP requirements or applicable regulatory guidelines in other countries;
- manufacturing sufficient quantities of product candidates or obtaining sufficient quantities of combination therapies for use in clinical trials;
- subjects failing to enroll or remain in our trials at the rate we expect, or failing to return for post-treatment follow-up;
- patients choosing alternative treatments for the indications for which we are developing our product candidates, or participating in competing clinical trials;

- lack of adequate funding to continue the clinical trials or costs being greater than we anticipate;
- subjects experiencing severe or unexpected drug-related adverse effects;
- occurrence of serious adverse events in trials of the same class of agents conducted by other companies;
- selection of clinical endpoints that require prolonged periods of clinical observation or analysis of the resulting data;
- transfer of manufacturing processes to larger-scale facilities operated by a CMO, delays or failure by our CMOs or us to make any necessary changes to such manufacturing process, or failure of our CMOs to produce clinical trial materials in accordance with cGMP regulations or other applicable requirements; and
- third parties being unwilling or unable to satisfy their contractual obligations to us in a timely manner.

Clinical trials must be conducted in accordance with the FDA and other applicable regulatory authorities' legal requirements, regulations or guidelines, and are subject to oversight by these governmental agencies and Ethics Committees or IRBs at the medical institutions where the clinical trials are conducted. We could also encounter delays if a clinical trial is suspended or terminated by us, by the IRBs of the institutions in which such trials are being conducted, by a Data Safety Monitoring Board for such trial or by the FDA or comparable foreign regulatory authorities. Such authorities may impose such a suspension or termination due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by the FDA or comparable foreign regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a drug, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial. In addition, changes in regulatory requirements and policies may occur, and we may need to amend clinical trial protocols to comply with these changes. Amendments may require us to resubmit our clinical trial protocols to IRBs for reexamination, which may impact the costs, timing or successful completion of a clinical trial.

Further, our conduct of clinical trials in foreign countries presents additional risks that may delay completion of our clinical trials. These risks include the failure of enrolled patients in foreign countries to adhere to clinical protocol as a result of differences in healthcare services or cultural customs, managing additional administrative burdens associated with foreign regulatory schemes, as well as political and economic risks, including war, relevant to such foreign countries.

Moreover, principal investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and receive compensation in connection with such services. Under certain circumstances, we may be required to report some of these relationships to the FDA or comparable foreign regulatory authorities. The FDA or comparable foreign regulatory authority may conclude that a financial relationship between us and a principal investigator has created a conflict of interest or otherwise affected interpretation of the study. The FDA or comparable foreign regulatory authority may therefore question the integrity of the data generated at the applicable clinical trial site and the utility of the clinical trial itself may be jeopardized. This could result in a delay in approval, or rejection, of our marketing applications by the FDA or comparable foreign regulatory authority, as the case may be, and may ultimately lead to the denial of marketing approval of one or more of our product candidates.

In addition, many of the factors that cause, or lead to, the termination or suspension of, or a delay in the commencement or completion of, clinical trials may also ultimately lead to the denial of regulatory approval of a product candidate. We may make formulation or manufacturing changes to our product candidates, in which case we may need to conduct additional preclinical studies to bridge our modified product candidates to earlier versions. Any delays to our clinical trials that occur as a result could shorten any period during which we may have the exclusive right to commercialize our product candidates and our competitors may be able to bring products to market before we do, and the commercial viability of our product candidates could be significantly reduced. Any of these occurrences may harm our business, financial condition and prospects significantly.

We may find it difficult to enroll patients in our clinical trials. If we encounter difficulties enrolling subjects in our clinical trials, our clinical development activities could be delayed or otherwise adversely affected.

We may not be able to initiate or continue clinical trials for our product candidates if we are unable to identify and enroll a sufficient number of eligible patients to participate in these trials as required by the FDA or similar regulatory authorities outside the United States. Subject enrollment, a significant factor in the timeline of clinical trials, is affected by many factors including the size and characteristics of the patient population, the proximity of patients to clinical sites, the eligibility and exclusion criteria for the trial, the design of the clinical trial, the risk that enrolled patients will not complete a

clinical trial, our ability to recruit clinical trial investigators with the appropriate competencies and experience, competing clinical trials and clinicians' and patients' perceptions as to the potential advantages and risks of the product candidate being studied in relation to other available therapies, including any new products that may be approved for the indications we are investigating as well as any product candidates under development. We will be required to identify and enroll a sufficient number of subjects for each of our clinical trials. Potential subjects for any planned clinical trials may not be adequately diagnosed or identified with the diseases which we are targeting or may not meet the entry criteria for such trials. In particular, because certain of our product candidates are focused on patients with specific molecular alterations within the RAS/MAPK pathway, our ability to enroll eligible patients may be limited or may result in slower enrollment than we anticipate. We also may encounter difficulties in identifying and enrolling patients with a stage of disease appropriate for our planned clinical trials and monitoring such patients adequately during and after treatment. Additionally, other pharmaceutical companies targeting these same types of cancer are recruiting clinical trial patients from these patient populations, which may make it more difficult to fully enroll our clinical trials. We may not be able to initiate or continue clinical trials if we are unable to locate a sufficient number of eligible subjects to participate in the clinical trials required by the FDA or comparable foreign regulatory authorities. In addition, the process of finding and diagnosing patients may prove costly. The timing of our clinical trials depends, in part, on the speed at which we can recruit patients to participate in our trials, as well as completion of required follow-up periods. The eligibility criteria of our clinical trials, once established, will further limit the pool of available trial participants. If patients are unwilling to participate in our trials for any reason, including the existence of concurrent clinical trials for similar patient populations, the availability of approved therapies, or we otherwise have difficulty enrolling a sufficient number of patients, the timeline for recruiting subjects, conducting studies and obtaining regulatory approval of our product candidates may be delayed. Additionally, because our clinical trials are in patients with relapsed/refractory cancer, the patients are typically in the late stages of their disease and may experience disease progression independent from our product candidates, making them unevaluable for purposes of the clinical trial and requiring additional patient enrollment. Our inability to enroll a sufficient number of subjects for any of our future clinical trials would result in significant delays or may require us to abandon one or more clinical trials altogether. In addition, we expect to rely on CROs and clinical trial sites to ensure proper and timely conduct of our future clinical trials and, while we have entered into agreements governing their services, we have limited influence over their actual performance. We cannot assure you that our assumptions used in determining expected clinical trial timelines are correct or that we will not experience delays in enrollment, which would result in the delay of completion of such trials beyond our expected timelines.

Use of our product candidates could be associated with side effects, adverse events or other properties or safety risks, which could delay or preclude approval, cause us to suspend or discontinue clinical trials, abandon a product candidate, limit the commercial profile of an approved label or result in other significant negative consequences that could severely harm our business, prospects, operating results and financial condition.

As is the case with oncology drugs generally, it is likely that there may be side effects and adverse events associated with our product candidates' use. Results of our clinical trials could reveal a high and unacceptable severity and prevalence of side effects or unexpected characteristics. Undesirable side effects caused by our product candidates when used alone or in combination with other approved or investigational drugs or biologics could cause us or regulatory authorities to interrupt, delay or halt clinical trials and could result in a more restrictive label, or lead to the delay or denial of regulatory approval by the FDA or comparable foreign regulatory authorities. The drug-related side effects could affect patient recruitment or the ability of enrolled patients to complete the trial or result in potential product liability claims. Any of these occurrences may harm our business, financial condition and prospects significantly.

Moreover, if our product candidates are associated with undesirable side effects in clinical trials or have characteristics that are unexpected, we may elect to abandon their development or limit their development to more narrow uses or subpopulations in which the undesirable side effects or other characteristics are less prevalent, less severe or more acceptable from a risk-benefit perspective, which may limit the commercial expectations for the product candidate if approved. Unacceptable enhancement of certain toxicities may be seen when our product candidates are combined with standard of care therapies, or when they are used as single agents. We may also be required to modify our development and clinical trial plans based on findings in our ongoing clinical trials. Many compounds that initially showed promise in early-stage testing for treating cancer have later been found to cause side effects that prevented further development of the compound. In addition, regulatory authorities may draw different conclusions or require additional testing to confirm these determinations.

It is possible that as we test our product candidates in larger, longer and more extensive clinical trials, including with different dosing regimens, or as the use of these product candidates becomes more widespread if they receive regulatory approval, illnesses, injuries, discomforts and other adverse events that were observed in earlier trials, as well as conditions that did not occur or went undetected in previous trials, may be reported by subjects. If such side effects

become known later in development or upon approval, if any, such findings may harm our business, financial condition and prospects significantly.

In addition, we plan to study our product candidates in combination with other therapies, including those that are also known to act on the RAS/MAPK pathway, which may exacerbate adverse events associated with such product candidates. Patients treated with our product candidates may also be undergoing surgical, radiation and chemotherapy treatments, which can cause side effects or adverse events that are unrelated to our product candidates but may still impact the success of our clinical trials. The inclusion of critically ill patients in our clinical trials may result in deaths or other adverse medical events due to other therapies or medications that such patients may be using or due to the gravity of such patients' illnesses. For example, it is expected that some of the patients enrolled in our clinical trials will die or experience major clinical events either during the course of our clinical trials or after participating in such trials, which has occurred in the past.

In addition, if one or more of our product candidates receives marketing approval, and we or others later identify undesirable side effects caused by such product, a number of potentially significant negative consequences could result, including:

- regulatory authorities may withdraw, suspend or limit approvals of such product, or seek an injunction against its manufacture or distribution;
- we may be required to recall a product or change the way such product is administered to patients;
- regulatory authorities may require additional warnings on the label, such as a "black box" warning or a contraindication;
- we may be required to implement a REMS or create a medication guide outlining the risks of such side effects for distribution to patients;
- we may be required to change the way a product is distributed or administered, conduct additional clinical trials or change the labeling of a product or be required to conduct additional post-marketing studies or surveillance;
- we could be sued and held liable for harm caused to patients;
- sales of the product may decrease significantly or the product could become less competitive; and
- our reputation may suffer.

Any of these events could prevent us from achieving or maintaining market acceptance of the particular product candidate, if approved, and could significantly harm our business, results of operations and prospects.

As an organization, we may be unable to complete clinical trials for any of our product candidates.

We are early in our development efforts for our product candidates, have never completed any clinical trials and we will need to successfully complete later-stage and pivotal clinical trials in order to obtain FDA or comparable foreign regulatory approval to market our product candidates. Carrying out later-stage clinical trials and the submission of a successful NDA or BLA or similar regulatory submissions to comparable foreign regulatory authorities is a complicated process. We are only beginning to conduct clinical trials for our product candidates, and we have limited experience as a company in preparing, submitting and prosecuting regulatory filings and have not previously submitted an NDA, BLA or other comparable foreign regulatory submission for any product candidate. We are also conducting and plan to conduct a number of clinical trials for multiple product candidates in parallel over the next several years, which may be a difficult process to manage with our limited resources and which may divert the attention of management. In addition, we have had limited interactions with the FDA or other comparable foreign regulatory authorities, and cannot be certain how many additional clinical trials of our product candidates will be required or how such trials should be designed. Consequently, we may be unable to successfully and efficiently execute and complete necessary clinical trials in a way that leads to regulatory submission and approval of any of our product candidates. We may require more time and incur greater costs than our competitors and may not succeed in obtaining regulatory approvals of product candidates that we develop. Failure to commence or complete, or delays in, our planned clinical trials could prevent us from or delay us in submitting marketing applications, including NDAs and BLAs, and commercializing our product candidates.

We intend to develop our product candidates in combination with other therapies, which exposes us to additional risks.

We intend to develop our current and any future product candidates for use in combination with one or more currently approved cancer therapies. Even if any product candidate we develop was to receive marketing approval or be commercialized for use in combination with other existing therapies, we would continue to bear the risks that the FDA or similar foreign regulatory authorities could revoke approval of the therapy used in combination with our product candidate or that safety, efficacy, manufacturing or supply issues could arise with these existing therapies. Combination therapies are commonly used for the treatment of cancer, and we would be subject to similar risks if we develop any of our product candidates for use in combination with other drugs or biologics or for indications other than cancer. Developing combination therapies using approved therapeutics, as we plan to do for our product candidates, also exposes us to additional clinical risks, such as the requirement that we demonstrate the safety and efficacy of each active component of any combination regimen we may develop.

In addition, we may evaluate our product candidates in combination with one or more other cancer therapies that have not yet been approved for marketing by the FDA or similar foreign regulatory authorities. We may not be able to market and sell any product candidate we develop in combination with any such unapproved cancer therapies that do not ultimately obtain marketing approval.

If the FDA or similar foreign regulatory authorities do not approve these other combination agents or revoke their approval of, or if safety, efficacy, manufacturing, or supply issues arise with the drugs or biologics we choose to evaluate in combination with our product candidates, we may be unable to obtain approval of or market our product candidates for combination therapy regimens.

Additionally, if the third-party providers of therapies or therapies in development used in combination with our product candidates are unable to produce sufficient quantities for clinical trials or for commercialization of our product candidates, or if the cost of combination therapies are prohibitive, our development and commercialization efforts would be impaired, which would have an adverse effect on our business, financial condition, results of operations and growth prospects.

The regulatory approval processes of the FDA and comparable foreign authorities are lengthy, time consuming and inherently unpredictable, and if we are ultimately unable to obtain regulatory approval for our product candidates, our business will be substantially harmed.

The clinical development, manufacturing, labeling, storage, record-keeping, advertising, promotion, import, export, marketing and distribution of our product candidates are subject to extensive regulation by the FDA in the U.S. and by comparable foreign regulatory authorities in foreign markets. In the U.S., we are not permitted to market our product candidates in the U.S. until we receive regulatory approval of a BLA or NDA from the FDA. The process of obtaining such regulatory approval is expensive, often takes many years following the commencement of clinical trials and can vary substantially based upon the type, complexity and novelty of the product candidates involved, as well as the target indications and patient population. Approval policies or regulations may change, and the FDA and comparable regulatory have substantial discretion in the approval process, including the ability to delay, limit or deny approval of a product candidate for many reasons. Despite the time and expense invested in clinical development of product candidates, regulatory approval of a product candidate is never guaranteed. Of the large number of drugs in development, only a small percentage successfully complete the FDA or foreign regulatory approval processes and are commercialized. Prior to obtaining approval to commercialize a product candidate in the U.S. or abroad, we must demonstrate with substantial evidence from adequate and well-controlled clinical trials, and to the satisfaction of the FDA or comparable foreign regulatory authorities, that such product candidates are safe and effective for their intended uses, and in the case of biological products in the U.S., that such product candidates are safe, pure and potent for their intended uses. Results from nonclinical studies and clinical trials can be interpreted in different ways. Even if we believe available nonclinical or clinical data support the safety purity, potency and/or efficacy of our product candidates, such data may not be sufficient to obtain approval from the FDA and comparable foreign regulatory authorities. The FDA or comparable foreign regulatory authorities, as the case may be, may also require us to conduct additional preclinical studies or clinical trials for our product candidates either prior to or post-approval, or may object to elements of our clinical development program. In particular, our SEACRAFT clinical trials are being designed based on the learnings from previously completed clinical trials conducted by Novartis. While we believe that we have reached alignment with US and European health authorities on the design of our global SEACRAFT-2 registrational trial, later developments with the FDA or European health authorities that may be inconsistent with our beliefs in the outcome of regulatory meetings, including that our planned SEACRAFT-2 trial, if successful, could support the registration of naporafenib.

The FDA or comparable foreign regulatory authorities can delay, limit or deny approval of a product candidate for many reasons, including:

- such authorities may disagree with the design or execution of our clinical trials;
- negative or ambiguous results from our clinical trials or results may not meet the level of statistical significance or persuasiveness required by the FDA or comparable foreign regulatory agencies for approval;
- serious and unexpected drug-related side effects may be experienced by participants in our clinical trials or by individuals using drugs similar to our product candidates;
- the population studied in the clinical trial may not be sufficiently broad or representative to assure safety in the full population for which we seek approval;
- such authorities may not accept clinical data from trials that are conducted at clinical facilities or in countries where the standard of care is potentially different from that of their own country;
- we may be unable to demonstrate that a product candidate's clinical and other benefits outweigh its safety risks;
- such authorities may disagree with our interpretation of data from preclinical studies or clinical trials;
- such authorities may not agree that the data collected from clinical trials of our product candidates are acceptable or sufficient to support the submission of a BLA, NDA or other submission or to obtain regulatory approval in the U.S. or elsewhere, and such authorities may impose requirements for additional preclinical studies or clinical trials;
- such authorities may disagree with us regarding the formulation, labeling and/or the product specifications of our product candidates;
- approval may be granted only for indications that are significantly more limited than those sought by us, and/or may include significant restrictions on distribution and use;
- such authorities may find deficiencies in the manufacturing processes or facilities of the third-party manufacturers with which we contract for clinical and commercial supplies; or
- such authorities may not accept a submission due to, among other reasons, the content or formatting of the submission.

With respect to foreign markets, approval procedures vary among countries and, in addition to the foregoing risks, may involve additional product testing, administrative review periods and agreements with pricing authorities. Even if we eventually complete clinical trials and receive approval of a BLA, NDA or comparable foreign marketing application for our product candidates, the FDA or comparable foreign regulatory authority may grant approval contingent on the performance of costly additional clinical trials and/or the implementation of a REMS, which may be required because the FDA believes it is necessary to ensure safe use of the product after approval. Any delay in obtaining, or inability to obtain, applicable regulatory approval would delay or prevent commercialization of that product candidate and would materially adversely impact our business and prospects.

Because we have a number of product candidates and development programs in our pipeline, we may expend our limited resources to pursue a particular product candidate and fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and managerial resources, we focus on specific product candidates, development programs and indications. We are also conducting and plan to conduct several clinical trials for multiple product candidates in parallel over the next several years, which may make our decision as to which product candidates to focus on more difficult. As a result, we may forgo or delay pursuit of opportunities with other product candidates that could have had greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable product candidates. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaborations, licenses and other similar arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate.

Additionally, we may pursue additional in-licenses or acquisitions of development-stage assets or programs, which entails additional risk to us. Identifying, selecting and acquiring promising product candidates requires substantial technical, financial and human resources expertise. Efforts to do so may not result in the actual acquisition or license of a particular product candidate, potentially resulting in a diversion of our management's time and the expenditure of our resources with no resulting benefit. For example, if we are unable to identify programs that ultimately result in approved products, we may spend material amounts of our capital and other resources evaluating, acquiring and developing products that ultimately do not provide a return on our investment.

We may not be able to obtain or maintain orphan designations for any of our product candidates, and we may be unable to maintain the benefits associated with orphan drug designation, including the potential for market exclusivity.

In June 2023, we announced that the FDA granted Orphan Drug Designation (ODD) to ERAS-801 for the treatment of patients with malignant glioma, which includes recurrent glioblastoma multiforme (GBM). We may seek ODD for our other product candidates; however, we may never receive such designations. Under the Orphan Drug Act of 1983, the FDA may designate a product as an orphan product candidate if it is intended to treat a rare disease or condition, which is generally defined as a patient population of fewer than 200,000 individuals in the United States, or a patient population of greater than 200,000 individuals in the United States, but for which there is no reasonable expectation that the cost of developing the drug or biologic will be recovered from sales in the United States. Orphan drug designation must be requested before submitting an NDA or BLA.

In the United States, ODD entitles a party to financial incentives such as opportunities for grant funding toward clinical trial costs, tax advantages and user-fee waivers. In addition, if a product candidate that has ODD subsequently receives the first FDA approval for the disease or condition for which it has such designation, the product is entitled to orphan drug exclusivity, which means that the FDA may not approve any other applications, including an NDA or BLA, to market the same product for the same disease or condition for seven years, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity or where the manufacturer is unable to assure sufficient product quantity.

Even if we obtain orphan drug exclusivity for a product, such exclusivity may not effectively protect the product from competition because different drugs and biologics can be approved for the same disease or condition. Even after an orphan drug or biologic is approved, the FDA or comparable foreign regulatory authority can subsequently approve the same drug or biologic for the same condition if such regulatory authority concludes that the later drug or biologic is clinically superior because it is shown to be safer, more effective or makes a major contribution to patient care. Orphan drug exclusivity may also be lost if the FDA later determines that the initial request for designation was materially defective, or if the sponsor seeks approval for an indication broader than the designated indication. In addition, orphan drug exclusivity does not prevent the FDA from approving competing drugs or biologics containing a different active ingredient for the same disease or condition. In addition, if a subsequent drug or biologic is approved for marketing for the same or a similar disease or condition as any of our product candidates that receive marketing approval, we may face increased competition and lose market share regardless of orphan drug exclusivity. ODD neither shortens the development time or regulatory review time of a drug nor gives the drug any advantage in the regulatory review or approval process.

Where applicable, we also may seek comparable designations for our product candidates in other jurisdictions, which may have differing requirements and would also include risks of not being granted and/or not being effective in protecting the product from competition.

We are currently conducting and may in the future conduct certain of our clinical trials for our product candidates outside of the United States. However, the FDA and other foreign equivalents may not accept data from such trials, in which case our development plans will be delayed, which could materially harm our business.

We are currently conducting and may in the future conduct one or more of our clinical trials for our product candidates outside the United States. The acceptance of data from clinical trials conducted outside the United States or another jurisdiction by the FDA or comparable foreign regulatory authority may be subject to certain conditions or may not be accepted at all. In cases where data from foreign clinical trials are intended to serve as the sole basis for marketing approval in the United States, the FDA will generally not approve the application on the basis of foreign data alone unless (i) the data are applicable to the US population and US medical practice; (ii) the trials were performed by clinical investigators of recognized competence and pursuant to GCP regulations; and (iii) the data may be considered valid without the need for an on-site inspection by the FDA, or if the FDA considers such inspection to be necessary, the FDA is

able to validate the data through an on-site inspection or other appropriate means. In addition, even where the foreign clinical trial data are not intended to serve as the sole basis for approval, if the clinical trial was not otherwise subject to an IND, the FDA will not accept the data as support for an application for marketing approval unless the trial was conducted in accordance with GCP requirements and the FDA is able to validate the data from the trial through an onsite inspection if deemed necessary. Many foreign regulatory authorities have similar approval requirements. In addition, such foreign trials would be subject to the applicable local laws of the foreign jurisdictions where the trials are conducted. There can be no assurance that the FDA or any comparable foreign regulatory authority will accept data from trials conducted outside of the United States or the applicable jurisdiction. If the FDA or any comparable foreign regulatory authority does not accept such data, it would result in the need for additional trials, which could be costly and time-consuming, and which may result in current or future product candidates that we may develop not receiving approval for commercialization in the applicable jurisdiction.

Conducting clinical trials outside the United States also exposes us to additional risks, including risks associated with:

- additional foreign regulatory requirements;
- foreign exchange fluctuations;
- compliance with foreign manufacturing, customs, shipment and storage requirements;
- inconsistent standards for reporting and evaluating clinical data and adverse events;
- cultural differences in medical practice and clinical research; and
- diminished protection of intellectual property in some countries.

Interim, topline and preliminary data from our clinical trials and preclinical studies that we announce or publish from time to time may change as more patient data become available and are subject to audit and verification procedures that could result in material changes in the final data.

From time to time, we may publicly disclose interim, top-line, or preliminary data from our clinical trials and preclinical studies, which is based on a preliminary analysis of then-available data, and the results and related findings and conclusions are subject to change following a full analyses of all data related to the particular trial. We also make assumptions, estimations, calculations and conclusions as part of our analyses of data, and we may not have received or had the opportunity to fully and carefully evaluate all data. As a result, the interim, top-line, or preliminary results that we report may differ from future results of the same trials, or different conclusions or considerations may qualify such results, once additional data have been received and fully evaluated. Top-line and preliminary data also remain subject to audit and verification procedures that may result in the final data being materially different from the preliminary data we previously published. As a result, top-line and preliminary data should be viewed with caution until the final data are available. We may also disclose interim data from our clinical trials.

Interim data from clinical trials that we may complete are also subject to the risk that one or more of the clinical outcomes may materially change as patient enrollment continues and more patient data become available. Adverse differences between interim, top-line, or preliminary data and final data could significantly harm our business prospects.

Further, others, including regulatory agencies, may not accept or agree with our assumptions, estimates, calculations, conclusions or analyses or may interpret or weigh the importance of data differently, which could impact the value of the particular program, the approvability or commercialization of the particular product candidate or product and our business in general. In addition, the information we choose to publicly disclose regarding a particular study or clinical trial is based on what is typically extensive information, and you or others may not agree with what we determine is the material or otherwise appropriate information to include in our disclosure, and any information we determine not to disclose may ultimately be deemed significant with respect to future decisions, conclusions, views, activities or otherwise regarding a particular drug, product candidate or our business. If the interim, top-line, or preliminary data that we report differ from actual results, or if others, including regulatory authorities, disagree with the conclusions reached, our ability to obtain approval for and commercialize our product candidates, our business, operating results, prospects or financial condition may be harmed.

We may attempt to secure approval from the FDA or comparable foreign regulatory authorities through the use of accelerated approval pathways. If we are unable to obtain such approval, we may be required to conduct additional clinical trials beyond those that we contemplate, which could increase the expense of obtaining, and delay the receipt of, necessary marketing approvals. Even if we receive accelerated approval from the FDA (or a similar expedited approval mechanism from a comparable foreign regulatory authority), if our confirmatory trials do not verify clinical benefit, or if we do not comply with rigorous post-marketing requirements, the FDA (or comparable foreign regulatory authority) may seek to withdraw any accelerated approval we have obtained.

We may in the future seek an expedited approval for one or more of our product candidates. Under the accelerated approval program, the FDA may grant accelerated approval to a product candidate designed to treat a serious or life-threatening condition that provides meaningful therapeutic benefit over available therapies upon a determination that the product candidate has an effect on a surrogate endpoint or intermediate clinical endpoint that is reasonably likely to predict clinical benefit. The FDA considers a clinical benefit to be a positive therapeutic effect that is clinically meaningful in the context of a given disease, such as irreversible morbidity or mortality. For the purposes of accelerated approval, a surrogate endpoint is a marker, such as a laboratory measurement, radiographic image, physical sign, or other measure that is thought to predict clinical benefit, but is not itself a measure of clinical benefit. An intermediate clinical endpoint is a clinical endpoint that can be measured earlier than an effect on irreversible morbidity or mortality that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit. The accelerated approval pathway may be used in cases in which the advantage of a new drug or biologic over available therapy may not be a direct therapeutic advantage, but is a clinically important improvement from a patient and public health perspective. If granted, accelerated approval and conditional approval are usually contingent on the sponsor's agreement to conduct, in a diligent manner, confirmatory studies to verify and describe the drug's clinical benefit. If such confirmatory studies fail to confirm the drug or biologic's clinical benefit or are not completed in a timely manner, the FDA may withdraw its approval of the drug or biologic on an expedited basis. In addition, in December 2022, President Biden signed an omnibus appropriations bill to fund the US government through fiscal year 2023. Included in that omnibus bill was the Food and Drug Omnibus Reform Act of 2022, which among other things, provided the FDA new statutory authority to mitigate potential risks to patients from continued marketing of ineffective drugs previously granted accelerated approval. Under these provisions, the FDA may require a sponsor of a product seeking accelerated approval to have a confirmatory trial underway prior to such approval being granted.

Prior to seeking approval for any of our product candidates, we intend to seek feedback from the applicable health authorities, such as the FDA and will otherwise evaluate our ability to seek and receive accelerated or conditional approval. There can be no assurance that after our evaluation of the feedback and other factors we will decide to pursue or submit an NDA, BLA, or comparable foreign marketing application for accelerated approval or any other form of expedited development, review or approval.

Furthermore, if we decide to submit an application for accelerated approval for our product candidates, there can be no assurance that such submission or application will be accepted or that any expedited development, review or approval will be granted on a timely basis, or at all. The FDA or other comparable foreign regulatory authority could also require us to conduct further studies prior to considering our application or granting approval of any type. A failure to obtain accelerated approval or any other form of expedited development, review or approval for our product candidate would result in a longer time period to commercialization of such product candidate, if any, could increase the cost of development of such product candidate and could harm our competitive position in the marketplace.

A Fast Track Designation may not lead to 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 received a FTD in the United States for ERAS-801 for the treatment of adult patients with glioblastoma (GBM) with epidermal growth factor receptor (EGFR) gene alterations, and for naporafenib in combination with trametinib for the treatment of adult patients with unresectable or metastatic melanoma who have progressed on, or are intolerant to, an anti-programmed death-1 (ligand 1) (PD(L)1)-based regimen, and whose tumors contain an NRASm, and we may seek FTD for other of our current or future product candidates. The Fast Track program is intended to expedite or facilitate the process for reviewing new product candidates that meet certain criteria. Specifically, drugs and biologic are eligible for FTD if they are intended, alone or in combination with one or more drugs or biologics, to treat a serious or life-threatening disease or condition and demonstrate the potential to address unmet medical needs for the disease or condition. FTD applies to the combination of the product candidate and the specific indication for which it is being studied. FTD allows for close and frequent interaction with the FDA during product development and, once a BLA or NDA is submitted, the application may be eligible for priority review. A NDA or BLA submitted for a Fast Track product candidate may also be

eligible for rolling review, where the FDA may consider for review sections of the NDA or BLA on a rolling basis before the complete application is submitted, if the sponsor provides a schedule for the submission of the sections of the NDA or BLA, the FDA agrees to accept sections of the NDA or BLA and determines that the schedule is acceptable, and the sponsor pays any required user fees upon submission of the first section of the application.

The FDA has broad discretion whether or not to grant this designation. Even if we believe a particular product candidate is eligible for this designation, we cannot assure you that the FDA would decide to grant it. Even if we do receive FTD for any of our product candidates, FTD does not guarantee FDA approval or expedited review for any application for the product candidate. The receipt of such a designation for a product candidate may not result in a faster development process, review, or approval compared to product candidates considered for approval under conventional FDA procedures and does not assure ultimate marketing approval by the FDA. In addition, the FDA may later decide that the product candidate no longer meets the FTD criteria.

Disruptions at the FDA and other government agencies caused by funding shortages or global health concerns could hinder their ability to hire, retain or deploy key leadership and other personnel, or otherwise prevent new or modified products from being developed, approved or commercialized in a timely manner or at all, 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, statutory, regulatory and policy changes, the FDA's ability to hire and retain key personnel and accept the payment of user fees, and other events that may otherwise affect the FDA's ability to perform routine functions. Average review times at the FDA have fluctuated in recent years. 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 and biologics or modifications to approved drugs and biologics to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, over the last several years, the US 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.

Separately, in response to the COVID-19 pandemic, the FDA postponed most inspections at domestic and foreign manufacturing facilities at various points. Even though the FDA has since resumed standard inspection operations, any resurgence of the virus may lead to other inspectional or administrative delays. If a prolonged government shutdown occurs, or if global health concerns 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.

If we are required by the FDA or comparable foreign regulatory authority to obtain approval of a companion diagnostic test in connection with approval of any of our product candidates, and we do not obtain or face delays in obtaining FDA or foreign approval of a diagnostic device, we may not be able to commercialize such product candidate and our ability to generate revenue will be materially impaired.

If safe and effective use of any of our product candidates depends on an *in vitro* diagnostic that is not otherwise commercially available, then the FDA generally may require approval or clearance of that diagnostic, known as a companion diagnostic, at the same time that the FDA approves our product candidates, if at all. According to FDA guidance, if the FDA determines that a companion diagnostic device is essential to the safe and effective use of a novel therapeutic product or indication, the FDA generally will not approve the therapeutic product or new therapeutic product indication if the companion diagnostic is not also approved or cleared for that indication. If a satisfactory companion diagnostic is not commercially available, we may be required to develop or obtain one that would be subject to regulatory approval requirements. The process of obtaining or creating such diagnostics is time-consuming and costly.

Companion diagnostics are developed in conjunction with clinical programs for the associated product and are subject to regulation as medical devices by the FDA and comparable regulatory authorities, and the FDA has generally required premarket approval of companion diagnostics for cancer therapies. The approval of a companion diagnostic as part of the therapeutic product's labeling limits the use of the therapeutic product to only those patients who express the specific genetic alteration that the companion diagnostic was developed to detect.

If the FDA or a comparable regulatory authority requires approval of a companion diagnostic for any of our product candidates, whether before, simultaneously with, or after such candidate obtains marketing approval, if ever, we, and/or future collaborators, may encounter difficulties in developing and obtaining approval for such companion diagnostic. Any delay or failure by us or third-party collaborators to develop or obtain regulatory approval of a companion diagnostic could delay or prevent approval or continued marketing of such product candidate. We may also experience delays in developing a sustainable, reproducible and scalable manufacturing process for the companion diagnostic or in transferring that process to commercial partners or negotiating insurance reimbursement plans, all of which may prevent us from completing our clinical trials or commercializing our product candidate, if approved, on a timely or profitable basis, if at all.

Risks related to our reliance on third parties

We rely on third parties to conduct our clinical trials and preclinical studies. If these third parties do not successfully carry out their contractual duties, comply with applicable regulatory requirements or meet expected deadlines, our development programs and our ability to seek or obtain regulatory approval for or commercialize our product candidates may be delayed.

We are dependent on third parties to conduct our clinical trials and preclinical studies. Specifically, we have used and relied on, and intend to continue to use and rely on, medical institutions, academic institutions, clinical investigators, CROs and consultants to conduct our preclinical studies and clinical trials in accordance with our clinical protocols, regulatory requirements and industry standards. These CROs, investigators and other third parties play a significant role in the conduct and timing of these trials and studies, and the subsequent collection and analysis of data. While we have and will have agreements governing the activities of our third-party contractors, we have limited influence over their actual performance. Nevertheless, we are responsible for ensuring that each of our clinical trials and preclinical studies is conducted in accordance with the applicable protocol and legal, regulatory and scientific standards, and our reliance on our CROs and other third parties does not relieve us of our responsibilities. We and our CROs are required to comply with GCP requirements, which are regulations and guidelines enforced by the FDA and comparable foreign regulatory authorities for all of our product candidates in clinical development. Regulatory authorities enforce these GCPs through periodic inspections of trial sponsors, principal investigators and trial sites. If we or any of our CROs or trial sites fail to comply with applicable GCPs, the clinical data generated in our clinical trials may be deemed unreliable, and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. In addition, our clinical trials must be conducted with product candidates and products produced under cGMP regulations. Our failure to comply with these regulations may require us to repeat clinical trials, which would delay the regulatory approval process.

There is no guarantee that any of our CROs, investigators or other third parties will devote adequate time and resources to such trials or studies or perform as contractually required. If any of these third parties fail to meet expected deadlines, adhere to our clinical protocols or meet regulatory requirements, or otherwise performs in a substandard manner, our clinical trials may be extended, delayed or terminated. In addition, many of the third parties with whom we contract may also have relationships with other commercial entities, including our competitors, for whom they may also be conducting clinical trials or other development activities that could harm our competitive position. In addition, principal investigators for our clinical trials are expected to serve as scientific advisors or consultants to us from time to time and may receive cash or equity compensation in connection with such services. If these relationships and any related compensation result in perceived or actual conflicts of interest, or the FDA concludes that the financial relationship may have affected the interpretation of the study, the integrity of the data generated at the applicable clinical trial site may be questioned and the utility of the clinical trial itself may be jeopardized, which could result in the delay or rejection by the FDA of any NDA or BLA we submit. Any such delay or rejection could prevent us from commercializing our product candidates.

Our CROs have the right to terminate their agreements with us in the event of an uncured material breach. In addition, some of our CROs have an ability to terminate their respective agreements with us if it can be reasonably demonstrated that the safety of the subjects participating in our clinical trials warrants such termination, if we make a general assignment for the benefit of our creditors or if we are liquidated. If any of our relationships with these third parties terminate, we may not be able to enter into arrangements with alternative third parties on commercially reasonable terms or at all. Switching or adding additional CROs, investigators and other third parties involves additional cost and requires our management’s time and focus. In addition, there is a natural transition period when a new CRO commences work. As a result, delays occur, which can materially impact our ability to meet our desired clinical development timelines. Though we carefully manage our relationships with our CROs, investigators and other third parties, there can be no assurance that we will not encounter challenges or delays in the future or that these delays or challenges will not have a material adverse impact on our business, financial condition and prospects.

We rely on third parties for the manufacture of our product candidates for clinical and preclinical development and expect to continue to do so for the foreseeable future. This reliance on third parties increases the risk that we will not have sufficient quantities of our product candidates or products or such quantities at an acceptable cost, which could delay, prevent or impair our development or commercialization efforts.

We do not own or operate manufacturing facilities and have no plans to develop our own clinical or commercial-scale manufacturing capabilities. We rely, and expect to continue to rely, on third parties for the manufacture of our product candidates and related raw materials for clinical and preclinical development, as well as for commercial manufacture if any of our product candidates receive marketing approval. The facilities used by third-party manufacturers to manufacture our product candidates must be approved by the FDA and any comparable foreign regulatory authority pursuant to inspections that will be conducted after we submit an NDA or BLA to the FDA or any comparable submission to a foreign regulatory authority. We do not control the manufacturing process of, and are completely dependent on, third-party manufacturers for compliance with cGMP requirements for manufacture of product candidates and products. If these third-party manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or any comparable foreign regulatory authority, they will not be able to secure and/or maintain regulatory approval for their manufacturing facilities. In addition, we have no control over the ability of third-party manufacturers to maintain adequate quality control, quality assurance and qualified personnel. If the FDA or any comparable foreign regulatory authority does not approve these facilities for the manufacture of our product candidates or if it withdraws any such approval in the future, we may need to find alternative manufacturing facilities, which would significantly impact our ability to develop, obtain regulatory approval for or market our product candidates, if approved. Our failure, or the failure of our third-party manufacturers, to comply with applicable regulations could result in sanctions being imposed on us, including clinical holds, fines, injunctions, civil penalties, delays, suspension or withdrawal of approvals, seizures or recalls of product candidates or products, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect supplies of our products.

Our or a third party's failure to execute on our manufacturing requirements on commercially reasonable terms and in compliance with cGMP or other regulatory requirements could adversely affect our business in a number of ways, including:

- an inability to initiate clinical trials of our product candidates under development;
- delay in submitting regulatory applications, or receiving marketing approvals, for our product candidates;
- additional inspections by regulatory authorities of third-party manufacturing facilities or our manufacturing facilities;
- requirements to cease development or to recall batches of our product candidates; and
- in the event of approval to market and commercialize a product, an inability to meet commercial demands for such product.

In addition, we do not have any long-term commitments or supply agreements with all of our third-party manufacturers. We may be unable to establish additional supply agreements with our third-party manufacturers or to do so on acceptable terms, which increases the risk of timely obtaining sufficient quantities of our product candidates or products or such quantities at an acceptable cost. Even if we are able to establish agreements with third-party manufacturers, reliance on third-party manufacturers entails additional risks, including:

- failure of third-party manufacturers to comply with regulatory requirements and maintain quality assurance;
- breach of the manufacturing agreement by the third party;
- failure to manufacture our product according to our specifications;
- failure to manufacture our product according to our schedule or at all;
- misappropriation of our proprietary information, including our trade secrets and know-how; and
- termination or nonrenewal of the agreement by the third party at a time that is costly or inconvenient for us.

Our product candidates and any products that we may develop may compete with other product candidates and products for access to manufacturing facilities. There are a limited number of manufacturers that operate under cGMP regulations and that might be capable of manufacturing for us, in particular due to the high potency of our product candidates.

Any performance failure on the part of our existing or future manufacturers could delay clinical development or marketing approval, and any related remedial measures may be costly or time-consuming to implement. We do not currently have arrangements in place for redundant supply or a second source for all required raw materials used in the manufacture of our product candidates. If our existing or future third-party manufacturers cannot perform as agreed, we may be required to replace such manufacturers and we may be unable to replace them on a timely basis or at all. In particular, any replacement of our manufacturers could require significant effort and expertise because there may be a limited number of qualified replacements. In some cases, the technical skills or technology required to manufacture our product candidates may be unique or proprietary to the original manufacturer and we may have difficulty transferring such skills or technology to another third-party and a feasible alternative may not exist. In addition, certain of our product candidates and our own proprietary methods have never been produced or implemented outside of our company, and we may therefore experience delays to our development programs if and when we attempt to establish new third-party manufacturing arrangements for these product candidates or methods.

Our current and anticipated future dependence upon others for the manufacture of our product candidates or products may adversely affect our future profit margins and our ability to commercialize any products that receive marketing approval on a timely and competitive basis.

Our reliance on third parties requires us to share our trade secrets, which increases the possibility that a competitor will discover them or that our trade secrets will be misappropriated or disclosed.

Because we currently rely on third parties to manufacture our product candidates and to perform quality testing, we must, at times, share our proprietary technology and confidential information, including trade secrets, with them. We seek to protect our proprietary technology, in part, by entering into confidentiality agreements, and, if applicable, material transfer agreements, collaborative research agreements, consulting agreements or other similar agreements with our collaborators, advisors, employees and consultants prior to beginning research or disclosing proprietary information. These agreements typically limit the rights of the third parties to use or disclose our confidential information. Despite the contractual provisions employed when working with third parties, the need to share trade secrets and other confidential information increases the risk that such trade secrets become known by our competitors, are intentionally or inadvertently incorporated into the technology of others or are disclosed or used in violation of these agreements. Given that our proprietary position is based, in part, on our know-how and trade secrets and despite our efforts to protect our trade secrets, a competitor's discovery of our proprietary technology and confidential information or other unauthorized use or disclosure would impair our competitive position and may have a material adverse effect on our business, financial condition, results of operations and prospects.

We may seek to enter into collaborations, licenses and other similar arrangements and may not be successful in doing so, and even if we are, we may relinquish valuable rights and may not realize the benefits of such relationships.

We may seek to enter into collaborations, joint ventures, licenses and other similar arrangements for the development or commercialization of our product candidates, due to capital costs required to develop or commercialize the product candidate or manufacturing constraints. Such collaborative discovery efforts may not yield additional development or product candidates for our pipeline. We may not be successful in our efforts to establish or maintain such collaborations for our product candidates because our research and development pipeline may be insufficient, our product candidates may be deemed to be at too early of a stage of development for collaborative effort or third parties may not view our product candidates as having the requisite potential to demonstrate safety and efficacy or significant commercial opportunity. In addition, we face significant competition in seeking appropriate strategic partners, and the negotiation process can be time-consuming and complex. We may have to relinquish valuable rights to our future revenue streams, research programs or product candidates, or grant licenses on terms that may not be favorable to us, as part of any such arrangement, and such arrangements may restrict us from entering into additional agreements with other potential collaborators. We cannot be certain that, following a collaboration, license or strategic transaction, we will achieve an economic benefit that justifies such transaction.

Even if we are successful in our efforts to establish such collaborations, the terms that we agree upon may not be favorable to us, and we may not be able to maintain such collaborations if, for example, the development or approval of a product candidate is delayed, the safety of a product candidate is questioned or the sales of an approved product candidate are unsatisfactory.

In addition, any potential future collaborations may be terminable by our strategic partners, and we may not be able to adequately protect our rights under these agreements. Furthermore, strategic partners may negotiate for certain rights to control decisions regarding the development and commercialization of our product candidates, if approved, and may not conduct those activities in the same manner as we do. Any termination of collaborations we enter into in the future, or any delay in entering into collaborations related to our product candidates, could delay the development and commercialization of our product candidates and reduce their competitiveness if they reach the market, which could have a material adverse effect on our business, financial condition and results of operations.

Risks related to commercialization of our product candidates

Even if we receive regulatory approval for any product candidate, we will be subject to ongoing regulatory obligations and continued regulatory review, which may result in significant additional expense.

Any regulatory approvals that we may receive for our product candidates will require the submission of reports to regulatory authorities and surveillance to monitor the safety and efficacy of the product, may contain significant limitations related to use restrictions for specified age groups, warnings, precautions or contraindications, and may include burdensome post-approval study or risk management requirements. For example, the FDA may require a REMS as a condition of approval of our product candidates, which could include requirements for a medication guide, physician communication plans or additional elements to ensure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. In addition, if the FDA or a comparable foreign regulatory authority approves our product candidates, the manufacturing processes, labeling, packaging, distribution, adverse event reporting, storage, advertising, promotion, import, export and recordkeeping for our products will be subject to extensive and ongoing regulatory requirements. These requirements include submissions of safety and other post-marketing information and reports, registration, as well as continued compliance with cGMP and GCP requirements for any clinical trials that we conduct post-approval. Manufacturers of approved products and their facilities are subject to continual review and periodic, unannounced inspections by the FDA and other regulatory authorities for compliance with cGMP regulations and standards. Later discovery of previously unknown problems with our products, including adverse events of unanticipated severity or frequency, or with our third-party manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may result in, among other things:

- restrictions on the marketing or manufacturing of our products, withdrawal of the product from the market or voluntary or mandatory product recalls;
- restrictions on product distribution or use, or requirements to conduct post-marketing studies or clinical trials;
- fines, restitutions, disgorgement of profits or revenue, warning letters, untitled letters or holds on clinical trials;
- refusal by the FDA to approve pending applications or supplements to approved applications filed by us or suspension or revocation of approvals;
- product seizure or detention, or refusal to permit the import or export of our products; and
- injunctions or the imposition of civil or criminal penalties.

The occurrence of any event or penalty described above may inhibit our ability to commercialize our product candidates and generate revenue and could require us to expend significant time and resources in response and could generate negative publicity.

The FDA's and other regulatory authorities' policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates. We also cannot predict the likelihood, nature or extent of government regulation that may arise from future legislation or administrative action, either in the United States or abroad. If we are slow or unable to adapt to changes in existing requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may be subject to enforcement action and we may not achieve or sustain profitability.

The FDA and other regulatory agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses.

If any of our product candidates are approved and we are found to have improperly promoted off-label uses of those products, we may become subject to significant liability. The FDA and other regulatory agencies strictly regulate the promotional claims that may be made about prescription products, such as our product candidates, if approved. In particular, a product may not be promoted for uses that are not approved by the FDA or such other regulatory agencies as

reflected in the product's approved labeling. If we receive marketing approval for a product candidate, physicians may nevertheless prescribe it to their patients in a manner that is inconsistent with the approved label. If we are found to have promoted such off-label uses, we may become subject to significant liability. The US federal government has levied large civil and criminal fines against companies for alleged improper promotion of off-label use and has enjoined several companies from engaging in off-label promotion. The government has also required companies to enter into consent decrees or imposed permanent injunctions under which specified promotional conduct is changed or curtailed. If we cannot successfully manage the promotion of our product candidates, if approved, we could become subject to significant liability, which would materially adversely affect our business and financial condition.

Our product candidates for which we intend to seek approval as biologic products may face competition sooner than anticipated.

The ACA includes the BPCIA, which created an abbreviated approval pathway for biological products that are biosimilar to or interchangeable with an FDA-licensed reference biological product. Under the BPCIA, an application for a highly similar or "biosimilar" product may not be submitted to the FDA until four years following the date that the reference product was first approved by the FDA. In addition, the approval of a biosimilar product may not be made effective by the FDA until 12 years from the date on which the reference product was first approved. During this 12-year period of exclusivity, another company may still market a competing version of the reference product if the FDA approves a full BLA for the competing product containing the sponsor's own preclinical data and data from adequate and well-controlled clinical trials to demonstrate the safety, purity and potency of their product. We believe that any of our product candidates approved as a biological product under a BLA should qualify for the 12-year period of exclusivity. However, there is a risk that this exclusivity could be shortened due to congressional action or otherwise, or that the FDA will not consider our product candidates to be reference products for competing products, potentially creating the opportunity for competition sooner than anticipated.

The commercial success of our product candidates will depend upon the degree of market acceptance of such product candidates by physicians, patients, healthcare payors and others in the medical community.

Our product candidates may not be commercially successful. Even if any of our product candidates receive regulatory approval, they may not gain market acceptance among physicians, patients, healthcare payors or the medical community. The commercial success of any of our current or future product candidates will depend significantly on the broad adoption and use of the resulting product by physicians and patients for approved indications. The degree of market acceptance of our products will depend on a number of factors, including:

- demonstration of clinical efficacy and safety compared to other more-established products;
- the indications for which our product candidates are approved;
- the limitation of our targeted patient population and other limitations or warnings contained in any FDA-approved labeling;
- acceptance of a new drug for the relevant indication by healthcare providers and their patients;
- the pricing and cost-effectiveness of our products, as well as the cost of treatment with our products in relation to alternative treatments and therapies;
- our ability to obtain and maintain sufficient third-party coverage and adequate reimbursement from government healthcare programs, including Medicare and Medicaid, private health insurers and other third-party payors;
- the willingness of patients to pay all, or a portion of, out-of-pocket costs associated with our products in the absence of sufficient third-party coverage and adequate reimbursement;
- any restrictions on the use of our products, and the prevalence and severity of any adverse effects;
- potential product liability claims;
- the timing of market introduction of our products as well as competitive drugs;
- the effectiveness of our or any of our current or potential future collaborators' sales and marketing strategies; and
- unfavorable publicity relating to the product, our company, or product candidates or similar approved products or product candidates in development by third parties.

If any product candidate is approved but does not achieve an adequate level of acceptance by physicians, hospitals, healthcare payors or patients, we may not generate sufficient revenue from that product and may not become or remain profitable. Our efforts to educate the medical community and third-party payors regarding the benefits of our products may require significant resources and may never be successful.

The successful commercialization of our product candidates, if approved, will depend in part on the extent to which governmental authorities and health insurers establish coverage, adequate reimbursement levels and favorable pricing policies. Failure to obtain or maintain coverage and adequate reimbursement for our products could limit our ability to market those products and decrease our ability to generate revenue.

The availability of coverage and the adequacy of reimbursement by governmental healthcare programs such as Medicare and Medicaid, private health insurers and other third-party payors are essential for most patients to be able to afford prescription medications such as our product candidates, if approved. Our ability to achieve coverage and acceptable levels of reimbursement for our products by third-party payors will have an effect on our ability to successfully commercialize those products. Accordingly, we will need to successfully implement a coverage and reimbursement strategy for any approved product candidate. Even if we obtain coverage for a given product by a third-party payor, the resulting reimbursement payment rates may not be adequate or may require co-payments that patients find unacceptably high. For products administered under the supervision of a physician, obtaining coverage and adequate reimbursement may be particularly difficult because of the higher prices often associated with such drugs. Additionally, separate reimbursement for the product itself or the treatment or procedure in which the product is used may not be available, which may impact physician utilization. We cannot be sure that coverage and reimbursement in the United States, the European Union or elsewhere will be available for any product that we may develop, and any reimbursement that may become available may be decreased or eliminated in the future.

Third-party payors increasingly are challenging prices charged for biopharmaceutical products and services, and many third-party payors may refuse to provide coverage and reimbursement for particular drugs when an equivalent generic drug or a less expensive therapy is available. It is possible that a third-party payor may consider our products as substitutable and only offer to reimburse patients for the less expensive product. Even if we are successful in demonstrating improved efficacy or improved convenience of administration with our products, pricing of existing drugs may limit the amount we will be able to charge for our products. These payors may deny or revoke the reimbursement status of a given product or establish prices for new or existing marketed products at levels that are too low to enable us to realize an appropriate return on our investment in product development. If reimbursement is not available or is available only at limited levels, we may not be able to successfully commercialize our products and may not be able to obtain a satisfactory financial return on products that we may develop. In addition, in the event that we develop companion diagnostic tests for use with our products, once approved, such companion diagnostic tests will require coverage and reimbursement separate and apart from the coverage and reimbursement for their companion pharmaceutical or biological products. Similar challenges to obtaining coverage and reimbursement applicable to pharmaceutical or biological products will apply to companion diagnostics tests.

There is significant uncertainty related to third-party payor coverage and reimbursement of newly approved products. In the United States, third-party payors, including private and governmental payors, such as the Medicare and Medicaid programs, play an important role in determining the extent to which new drugs will be covered. Some third-party payors may require pre-approval of coverage for new or innovative devices or drug therapies before they will reimburse healthcare providers who use such therapies. It is difficult to predict at this time what third-party payors will decide with respect to the coverage and reimbursement for our products.

Obtaining and maintaining reimbursement status is time-consuming, costly and uncertain. The Medicare and Medicaid programs increasingly are used as models for how private payors and other governmental payors develop their coverage and reimbursement policies for drugs. However, no uniform policy for coverage and reimbursement for products exists among third-party payors in the United States. Therefore, coverage and reimbursement for products can differ significantly from payor to payor. As a result, the coverage determination process is often a time-consuming and costly process that will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage and adequate reimbursement will be applied consistently or obtained in the first instance. Furthermore, rules and regulations regarding reimbursement change frequently, in some cases at short notice, and we believe that changes in these rules and regulations are likely.

Outside the United States, international operations are generally subject to extensive governmental price controls and other market regulations, and we believe the increasing emphasis on cost-containment initiatives in Europe and other countries has and will continue to put pressure on the pricing and usage of our products. In many countries, the prices of

medical products are subject to varying price control mechanisms as part of national health systems. Other countries allow companies to fix their own prices for medical products but monitor and control company profits. Additional foreign price controls or other changes in pricing regulation could restrict the amount that we are able to charge for our products. Accordingly, in markets outside the United States, the reimbursement for our products may be reduced compared with the United States and may be insufficient to generate commercially reasonable revenue and profits.

Moreover, increasing efforts by governmental and third-party payors in the United States and abroad to cap or reduce healthcare costs may cause such organizations to limit both coverage and the level of reimbursement for newly approved products and, as a result, they may not cover or provide adequate payment for our products. We expect to experience pricing pressures in connection with the sale of any of our products due to the trend toward managed healthcare, the increasing influence of health maintenance organizations and additional legislative changes. The downward pressure on healthcare costs in general, particularly prescription drugs and surgical procedures and other treatments, has become very intense. As a result, increasingly high barriers are being erected to the entry of new products.

We face significant competition from entities that have developed or may develop product candidates for cancer, including companies developing novel treatments and technology platforms. If our competitors develop technologies or product candidates more rapidly than we do or their technologies are more effective, our business and our ability to develop and successfully commercialize products may be adversely affected.

Although the biotechnology and pharmaceutical industries, and the oncology sector, are characterized by rapid evolution of technologies, fierce competition, and strong defense of intellectual property rights, we believe the most fearsome competitor of all is cancer itself. As such, we view other companies in this sector more as potential allies and collaborators than as competitors, as we all have a common cause: to defeat cancer. Many of the companies that are developing or marketing treatments for cancer, including major pharmaceutical and biotechnology companies that are working on therapies targeting the RAS/MAPK pathway, are companies with whom we endeavor to collaborate in our mission to erase cancer. That being said, our commercial potential could be reduced or eliminated if other companies develop and commercialize products that are safer, more effective, have fewer or less severe side effects, are more convenient or are less expensive than products that we may develop. Our competitors have developed, are developing or may develop products, product candidates and processes competitive with our product candidates. Any product candidates that we successfully develop and commercialize will compete with existing therapies and new therapies that may become available in the future. We believe that a significant number of products are currently under development, and may become commercially available in the future, for the treatment of indications for which we may attempt to develop product candidates. In particular, there is intense competition in the oncology field. Our competitors include larger and better funded pharmaceutical, biopharmaceutical, biotechnological and therapeutics companies. Moreover, we may also compete with universities and other research institutions who may be active in oncology research and could be in direct competition with us. We also compete with these organizations to recruit management, scientists and clinical development personnel, which could negatively affect our level of expertise and our ability to execute our business plan. We will also face competition in establishing clinical trial sites, enrolling subjects for clinical trials and in identifying and in-licensing new product candidates. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies.

If any of our product candidates are approved, they will compete with small molecule therapies, biologics, cell-based therapies and traditional chemotherapy, either approved or under development, which are intended to treat the same indications that we are targeting or may target, including through approaches that may prove to be more effective, have fewer side effects, be less costly to manufacture, be more convenient to administer or have other advantages over our product candidates. In addition to competing with other therapies targeting similar indications, there are numerous other companies and academic institutions focused on similar targets as our product candidates and/or different scientific approaches to treating the same indications. We face competition from such companies in seeking any future potential collaborations to partner our product candidates, as well as potentially competing commercially for any approved products.

Specifically, there are also a number of pharmaceutical companies with product candidates in development that target the nodes involving the RAS/MAPK pathway. These include, among others, Amgen, AstraZeneca, Black Diamond Therapeutics, BioMed Valley Discoveries, Boehringer Ingelheim, BridgeBio, Bristol Myers Squibb, Deciphera Pharmaceuticals, Eli Lilly, Jacobio Pharmaceuticals, Janssen, Merck, Novartis, Pfizer, Revolution Medicines, Roche/Genentech, and Sanofi.

Many of our competitors have significantly greater financial, technical, manufacturing, marketing, sales and supply resources or experience than we do. If we successfully obtain approval for any product candidate, we will face competition based on many different factors, including the safety and effectiveness of our products, the ease with which our products can be administered and the extent to which patients accept relatively new routes of administration, the timing and scope of regulatory approvals for these products, the availability and cost of manufacturing, marketing and sales capabilities, price, reimbursement coverage and patent position. Competing products could present superior treatment alternatives, including by being more effective, safer, more convenient, less expensive or marketed and sold more effectively than any products we may develop. Competitive products approaches may make any products we develop obsolete or noncompetitive before we recover the expense of developing and commercializing our product candidates. If we are unable to compete effectively, our opportunity to generate revenue from the sale of our products we may develop, if approved, could be adversely affected.

The market opportunities for our product candidates may be limited to patients who are ineligible for or have failed prior treatments and may be small or different from our estimates.

Cancer therapies are defined by lines of therapy as well as by treatment-naïve or previously-treated status. Often the initial approval for a new therapy is in later lines and subsequent approval in an earlier line may not be feasible. When cancer is detected early enough, first line therapy is sometimes adequate to cure the cancer or prolong life without a cure. Whenever first line therapy, including targeted therapy, immunotherapy, chemotherapy, hormone therapy, surgery or a combination of these, proves unsuccessful, second line therapy may be administered. Second line therapies often consist of additional chemotherapy, radiation, antibody drugs, tumor targeted small molecules or a combination of these. Third line therapies can include bone marrow transplantation, antibody and small molecule targeted therapies, more invasive forms of surgery and new technologies. In markets with approved therapies, there is no guarantee that our product candidates, even if approved, would be approved for second line or first line therapy. This could limit our potential market opportunity. In addition, we may have to conduct additional clinical trials prior to gaining approval for second line or first line therapy.

Our projections of both the number of people who have the cancers we are targeting, as well as the subset of people with these cancers in a position to receive later stage therapy and who have the potential to benefit from treatment with our product candidates, are based on our beliefs and estimates. These estimates have been derived from a variety of sources, including the scientific literature, publicly available clinical molecular reports, patient foundations or market research, and may prove to be incorrect. Further, new trials or information may change the estimated incidence or prevalence of these cancers. The number of patients in the United States and other major markets and elsewhere may turn out to be lower than expected, patients may not be otherwise amenable to treatment with our products or new patients may become increasingly difficult to identify or gain access to, all of which would adversely affect our results of operations and our business. Further, even if we obtain significant market share for our product candidates, because some of our potential target populations are very small, we may never achieve profitability despite obtaining such significant market share.

We currently have no marketing and sales organization and have no experience as a company in commercializing products, and we may have to invest significant resources to develop these capabilities. If we are unable to establish marketing and sales capabilities or enter into agreements with third parties to market and sell our products, we may not be able to generate product revenue.

We have no internal sales, marketing or distribution capabilities, nor have we ever commercialized a product. If any of our product candidates ultimately receives regulatory approval, we must build a marketing and sales organization with technical expertise and supporting distribution capabilities to commercialize each such product in major markets, which will be expensive and time-consuming, or collaborate with third parties that have direct sales forces and established distribution systems, either to augment our own sales force and distribution systems or in lieu of our own sales force and distribution systems. We have no prior experience as a company in the marketing, sale and distribution of biopharmaceutical products and there are significant risks involved in building and managing a sales organization, including our ability to hire, retain and incentivize qualified individuals, generate sufficient sales leads, provide adequate training to sales and marketing personnel and effectively manage a geographically dispersed sales and marketing team. Any failure or delay in the development of our internal sales, marketing and distribution capabilities would adversely impact the commercialization of these products. We may not be able to enter into collaborations or hire consultants or external service providers to assist us in sales, marketing and distribution functions on acceptable financial terms, or at all. In addition, our product revenue and our profitability, if any, may be lower if we rely on third parties for these functions than if we were to market, sell and distribute any products that we develop ourselves. We likely will have little control over such third parties, and any of them may fail to devote the necessary resources and attention to sell and market our

products effectively. If we are not successful in commercializing our products, either on our own or through arrangements with one or more third parties, we may not be able to generate any future product revenue and we would incur significant additional losses.

Our future growth may depend, in part, on our ability to operate in foreign markets, where we would be subject to additional regulatory burdens and other risks and uncertainties.

Our future growth may depend, in part, on our ability to develop and commercialize our product candidates in foreign markets. We are not permitted to market or promote any of our product candidates before we receive regulatory approval from applicable regulatory authorities in foreign markets, and we may never receive such regulatory approvals for any of our product candidates. To obtain separate regulatory approval in many other countries we must comply with numerous and varying regulatory requirements regarding safety and efficacy and governing, among other things, clinical trials, commercial sales, pricing and distribution of our product candidates. If we obtain regulatory approval of our product candidates and ultimately commercialize our products in foreign markets, we would be subject to additional risks and uncertainties, including:

- different regulatory requirements for approval of drugs in foreign countries;
- reduced protection for intellectual property rights;
- the existence of additional third-party patent rights of potential relevance to our business;
- unexpected changes in tariffs, trade barriers and regulatory requirements;
- economic weakness, including inflation, or political instability in particular foreign economies and markets;
- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- foreign currency fluctuations, which could result in increased operating expenses and reduced revenue, and other obligations incident to doing business in another country;
- foreign reimbursement, pricing and insurance regimes;
- workforce uncertainty in countries where labor unrest is common;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad; and
- business interruptions resulting from geopolitical actions, including war and terrorism, or natural disasters including earthquakes, typhoons, floods and fires.

Risks related to our business operations and industry

Our operating results may fluctuate significantly, which makes our future operating results difficult to predict and could cause our operating results to fall below expectations or any guidance we may provide.

Our quarterly and annual operating results may fluctuate significantly, which makes it difficult for us to predict our future operating results. These fluctuations may occur due to a variety of factors, many of which are outside of our control, including, but not limited to:

- the timing and cost of, and level of investment in, research, development, regulatory approval and commercialization activities relating to our product candidates, which may change from time to time;
- the timing and success or failure of preclinical studies or clinical trials for our product candidates or competing product candidates, or any other change in the competitive landscape of our industry, including consolidation among our competitors or partners;
- coverage and reimbursement policies with respect to our product candidates, if approved, and potential future drugs that compete with our products;
- the cost of manufacturing our product candidates, which may vary depending on the quantity of production and the terms of our agreements with third-party manufacturers;
- expenditures that we will or may incur to acquire, develop or commercialize additional product candidates and technologies or other assets;

- the level of demand for any approved products, which may vary significantly and be difficult to predict; and
- future accounting pronouncements or changes in our accounting policies.

The cumulative effects of these factors could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. Investors should not rely on our past results as an indication of our future performance.

This variability and unpredictability could also result in our failing to meet the expectations of industry or financial analysts or investors for any period. If our revenue or operating results fall below the expectations of analysts or investors or below any forecasts we may provide to the market, or if the forecasts we provide to the market are below the expectations of analysts or investors, the price of our common stock could decline substantially. Such a stock price decline could occur even when we have met any previously publicly stated revenue or earnings guidance we may provide.

Our success is dependent on our ability to attract and retain highly qualified management and other clinical and scientific personnel.

Our success depends in part on our continued ability to attract, retain, manage, and motivate highly qualified management, clinical, and scientific personnel, and we face significant competition for experienced personnel. We are highly dependent upon our senior management, as well as our senior scientists and other members of our management team. The loss of services of any of these individuals could delay or prevent the successful development of our product pipeline, initiation, or completion of our clinical trials and preclinical studies or the commercialization of our product candidates. Although we have executed employment agreements or offer letters with each member of our senior management team, these agreements are terminable at will with or without notice and, therefore, we may not be able to retain their services as expected. We do not currently maintain “key person” life insurance on the lives of our executives or any of our employees. This lack of insurance means that we may not have adequate compensation for the loss of the services of these individuals.

We will need to expand and effectively manage our managerial, operational, financial, and other resources in order to successfully pursue our clinical development and commercialization efforts. We may not be successful in maintaining our unique company culture and continuing to attract or retain qualified management, clinical, and scientific personnel in the future due to the intense competition for qualified personnel among biopharmaceutical, biotechnology, and other businesses, particularly in the San Diego area. Our industry has experienced a high rate of turnover of management personnel in recent years. If we are not able to attract, integrate, retain, and motivate necessary personnel to accomplish our business objectives, we may experience constraints that will significantly impede the achievement of our development objectives, our ability to raise additional capital, and our ability to implement our business strategy.

We may encounter difficulties in managing our growth and expanding our operations successfully.

We have increased our organization from 30 employees as of December 31, 2019 to 126 full-time employees as of February 29, 2024. As we continue development and pursue the potential commercialization of our product candidates, as well as function as a public company, we will need to expand our financial, development, regulatory, manufacturing, marketing and sales capabilities or contract with third parties to provide these capabilities for us. As our operations expand, we expect that we will need to manage additional relationships with various strategic partners, suppliers and other third parties. Our future financial performance and our ability to develop and commercialize our product candidates and to compete effectively will depend, in part, on our ability to manage any future growth effectively.

We are subject to various US federal, state and foreign healthcare laws and regulations, which could increase compliance costs, and our failure to comply with these laws and regulations could harm our reputation, subject us to significant fines and liability or otherwise adversely affect our business.

Our business operations and current and future arrangements with investigators, healthcare professionals, consultants, third-party payors, patient organizations and customers expose us to broadly applicable foreign, federal and state fraud and abuse and other healthcare laws and regulations. These laws may constrain the business or financial arrangements and relationships through which we conduct our operations, including how we research, market, sell and distribute any products for which we obtain marketing approval. Such laws include:

- the federal Anti-Kickback Statute, which prohibits, among other things, persons or entities from knowingly and willfully soliciting, offering, receiving or providing any remuneration (including any kickback, bribe or certain rebates), directly or indirectly, overtly or covertly, in cash or in kind, in return for, either the referral of an

individual or the purchase, lease, or order, or arranging for or recommending the purchase, lease, or order of any good, facility, item or service, for which payment may be made, in whole or in part, under a federal healthcare program such as Medicare and Medicaid. A person or entity does not need to have actual knowledge of the federal Anti-Kickback Statute or specific intent to violate it in order to have committed a violation;

- the federal false claims laws, including the civil False Claims Act, and civil monetary penalties laws, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, to the federal government, claims for payment or approval that are false or fraudulent, knowingly making, using or causing to be made or used, a false record or statement material to a false or fraudulent claim, or from knowingly making or causing to be made a false statement to avoid, decrease or conceal an obligation to pay money to the federal government. In addition, the government may assert that a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the civil False Claims Act;
- the federal Health Insurance Portability and Accountability Act of 1996 (HIPAA), which imposes criminal and civil liability for, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, or 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. Similar to the federal Anti-Kickback Statute, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it in order to have committed a violation;
- the federal Physician Payments Sunshine Act, which requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program (with certain exceptions) to report annually to the CMS, information related to payments and other "transfers of value" made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors), certain non-physician practitioners (physician assistants, nurse practitioners, clinical nurse specialists, certified nurse anesthetists, anesthesiology assistants and certified nurse-midwives) and teaching hospitals, as well as ownership and investment interests held by such healthcare professionals and their immediate family members; and
- analogous state and foreign laws and regulations, such as state anti-kickback and false claims laws, may apply to sales or marketing arrangements and claims involving healthcare items or services reimbursed by non-governmental third-party payors, including private insurers; some state laws require biotechnology companies to comply with the biotechnology industry's voluntary compliance guidelines and the relevant compliance guidance promulgated by the federal government and may require certain biotechnology companies to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; some state laws that require biotechnology companies to report information on the pricing of certain drug products; and some state and local laws require the registration or pharmaceutical sales representatives.

Efforts to ensure that our current and future business arrangements with third parties will comply with applicable healthcare laws and regulations will involve ongoing 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 penalties, including civil, criminal and administrative penalties, damages, fines, disgorgement, imprisonment, exclusion from participation in government funded healthcare programs, including Medicare and Medicaid, integrity oversight and reporting obligations, contractual damages, reputational harm, diminished profits and future earnings and the curtailment or restructuring of our operations. Defending against any such actions can be costly, time-consuming and may require significant financial and personnel resources. Therefore, even if we are successful in defending against any such actions that may be brought against us, our business may be impaired. Further, if any of the physicians or other healthcare providers or entities with whom we expect to do business is found to be not in compliance with applicable laws, they may be subject to significant criminal, civil or administrative sanctions, including exclusions from government funded healthcare program.

Recently enacted legislation, future legislation and healthcare reform measures may increase the difficulty and cost for us to obtain marketing approval for and commercialize our product candidates and may affect the prices we may set.

In the United States and some foreign jurisdictions, there have been, and we expect there will continue to be, a number of legislative and regulatory changes to the healthcare system, including cost-containment measures that may reduce or limit coverage and reimbursement for newly approved drugs and affect our ability to profitably sell any product candidates for which we obtain marketing approval. In particular, there have been and continue to be a number of initiatives at the US federal and state levels that seek to reduce healthcare costs and improve the quality of healthcare.

For example, in March 2010, the ACA was enacted in the United States. Among the provisions of the ACA of importance to our potential product candidates, the ACA: established an annual, nondeductible fee on any entity that manufactures or imports specified branded prescription drugs and biologic agents; extended manufacturers' Medicaid rebate liability to covered drugs dispensed to individuals who are enrolled in Medicaid managed care organizations; expands eligibility criteria for Medicaid programs; expanded the entities eligible for discounts under the Public Health Service pharmaceutical pricing program; increased the statutory minimum rebates a manufacturer must pay under the Medicaid Drug Rebate Program; creates a new Medicare Part D coverage gap discount program; established a new Patient-Centered Outcomes Research Institute to oversee, identify priorities in and conduct comparative clinical effectiveness research, along with funding for such research; and established a Center for Medicare and Medicaid Innovation at CMS to test innovative payment and service delivery models to lower Medicare and Medicaid spending.

There have been executive, judicial and Congressional challenges to certain aspects of the ACA. On June 17, 2021, the US Supreme Court dismissed the most recent judicial challenge to the ACA brought by several states without specifically ruling on the constitutionality of the ACA. Prior to the Supreme Court's decision, President Biden issued an executive order to initiate a special enrollment period from February 15, 2021 through August 15, 2021 for purposes of obtaining health insurance coverage through the ACA marketplace. The executive order also instructed certain governmental agencies to review and reconsider their existing policies and rules that limit access to healthcare, including among others, reexamining Medicaid demonstration projects and waiver programs that include work requirements, and policies that create unnecessary barriers to obtaining access to health insurance coverage through Medicaid or the ACA.

In addition, other legislative changes have been proposed and adopted since the ACA was enacted. On August 2, 2011, the Budget Control Act of 2011 was signed into law, which, among other things, resulted in reductions to Medicare payments to providers, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, will remain in effect through 2032, with the exception of a temporary suspension from May 1, 2020 through March 31, 2022, unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. In addition, on March 11, 2021, the American Rescue Plan Act of 2021 was signed into law, which eliminated the statutory Medicaid drug rebate cap, beginning January 1, 2024. The rebate was previously capped at 100% of a drug's average manufacturer price.

Further, there has been heightened governmental scrutiny in the United States of pharmaceutical pricing practices in light of the rising cost of prescription drugs. Such scrutiny has resulted in several recent congressional inquiries and proposed and enacted federal and state legislation designed to, among other things, bring more transparency to product pricing, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for products. On August 16, 2022, the Inflation Reduction Act of 2022, or IRA, was into law. Among other things, the IRA requires manufacturers of certain drugs to engage in price negotiations with Medicare (beginning in 2026), imposes rebates under Medicare Part B and Medicare Part D to penalize price increases that outpace inflation (first due in 2023), and replaces the Part D coverage gap discount program with a new discounting program (beginning in 2025). The IRA permits the Secretary of the Department of Health and Human Services to implement many of these provisions through guidance, as opposed to regulation, for the initial years. On August 29, 2023, HHS announced the list of the first ten drugs that will be subject to price negotiations. HHS has issued and will continue to issue guidance implementing the IRA, although the Medicare drug price negotiation program is currently subject to legal challenges. While the impact of the IRA on the pharmaceutical industry cannot yet be fully determined, it is likely to be significant.

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, designed to

encourage importation from other countries and bulk purchasing. Legally mandated price controls on payment amounts by third-party payors or other restrictions could harm our business, results of operations, financial condition and prospects. In addition, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription drug and other healthcare programs. This could reduce the ultimate demand for our product candidates, if approved, or put pressure on our product pricing, which could negatively affect our business, results of operations, financial condition and prospects.

We expect that these new laws and other healthcare reform measures that may be adopted in the future may result in additional reductions in Medicare and other healthcare funding, more rigorous coverage criteria, new payment methodologies and additional downward pressure on the price that we receive for any approved product. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. The implementation of cost containment measures or other healthcare reforms may prevent us from being able to generate revenue, attain profitability or commercialize our product candidates, if approved.

If product liability lawsuits are brought against us, we may incur substantial liabilities and may be required to limit commercialization of our products.

We face an inherent risk of product liability as a result of the clinical trials of our product candidates and will face an even greater risk if we commercialize our product candidates. For example, we may be sued if our product candidates allegedly cause injury or are found to be otherwise unsuitable during product testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product candidate, negligence, strict liability and a breach of warranties. Claims may be brought against us by clinical trial participants, patients or others using, administering or selling products that may be approved in the future. Claims could also be asserted under state consumer protection acts.

If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit or cease the commercialization of our products. Even a successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for our products;
- injury to our reputation and significant negative media attention;
- withdrawal of clinical trial participants;
- costs to defend the related litigation;
- a diversion of our management’s time and our resources;
- substantial monetary awards to trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- significant negative financial impact;
- the inability to commercialize our product candidates; and
- a decline in our stock price.

We currently hold approximately $10 million in product liability insurance coverage in the aggregate. We may need to increase our insurance coverage as we expand our clinical trials or if we commence commercialization of our product candidates. Insurance coverage is increasingly expensive. Our inability to obtain and retain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of our product candidates. Although we will maintain such insurance, any claim that may be brought against us could result in a court judgment or settlement in an amount that is not covered, in whole or in part, by our insurance or that is in excess of the limits of our insurance coverage. Our insurance policies will also have various exclusions, and we may be subject to a product liability claim for which we have no coverage. We may have to pay any amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are not covered by our insurance, and we may not have, or be able to obtain, sufficient capital to pay such amounts.

Our insurance policies are expensive and only protect us from some business risks, which will leave us exposed to significant uninsured liabilities.

We do not carry insurance for all categories of risk that our business may encounter. Some of the policies we currently maintain include property, general liability, employment benefits liability, business automobile, workers' compensation, products liability, malicious invasion of our electronic systems, clinical trials, and directors' and officers' employment practices and fiduciary liability insurance. We do not know, however, if we will be able to maintain insurance with adequate levels of coverage. No assurance can be given that an insurance carrier will not seek to cancel or deny coverage after a claim has occurred. Any significant uninsured liability may require us to pay substantial amounts, which would adversely affect our financial position and results of operations.

We and any of our potential future collaborators will be required to report to regulatory authorities if any of our approved products cause or contribute to adverse medical events, and any failure to do so would result in sanctions that would materially harm our business.

If we or any of our potential future collaborators are successful in commercializing our products, the FDA and foreign regulatory authorities would require that we and such collaborators report certain information about adverse medical events if those products may have caused or contributed to those adverse events. The timing of our obligation to report would be triggered by the date we become aware of the adverse event as well as the nature of the event. We and any of our potential future collaborators or CROs may fail to report adverse events within the prescribed timeframe. If we or any of our potential future collaborators or CROs fail to comply with such reporting obligations, the FDA or a foreign regulatory authority could take action, including criminal prosecution, the imposition of civil monetary penalties, seizure of our products or delay in approval or clearance of future products.

Our information technology systems, or those of any of our CROs, manufacturers, other contractors or consultants or current or potential future collaborators, may fail or suffer cybersecurity incidents or breaches, which could result in a material disruption of our product development programs, harm to our reputation, significant fines, penalties and liability and loss of customers or sales.

In the ordinary course of business, we collect, store, transmit and otherwise process large amounts of data including, without limitation, proprietary business information and personal information. Despite the implementation of security measures, our information technology systems (including infrastructure) and those of our current and any future CROs and other contractors, consultants, third-party service providers, vendors and collaborators are vulnerable to numerous and evolving cybersecurity risks, including from diverse threat actors such as state-sponsored organizations, opportunistic hackers and hacktivists, as well as through diverse attack vectors (such as denial-of-service attacks, malware, ransomware, supply chain attacks, computer viruses, cyber-attacks or cyber-intrusions over the Internet, hacking, phishing and other social engineering attacks), and as a result of malicious code, misconfigurations, 'bugs' or other vulnerabilities in software that is integrated into our (or our suppliers' or service providers') IT systems, products or services, alongside damage from natural disasters, terrorism, war and telecommunication and electrical failures. Our systems are also subject to compromise from internal threats, such as theft, misuse, unauthorized access or other improper or accidental actions by employees, vendors and other third parties with otherwise legitimate access to our systems. Third parties may also attempt to fraudulently induce our employees and contractors into disclosing sensitive information such as usernames, passwords or other information, or otherwise compromise the security of our electronic systems, networks, and/or physical facilities in order to gain access to our data. Attacks upon information technology systems are increasing in their frequency, levels of persistence, sophistication and intensity, and are being conducted by sophisticated and organized groups and individuals with a wide range of motives, expertise, techniques and tools – including artificial intelligence – to circumvent security controls, evade detection and remove forensic evidence. Additionally, we currently work in a hybrid working environment, which may cause increased cybersecurity risks due to our reliance on internet technology and the number of our employees (and employees of our vendors, contractors and other organizations with whom we have formed strategic relationships) who are working remotely, which may create additional opportunities for threat actors to exploit vulnerabilities. Furthermore, new techniques may not be identified until they are launched against a target, and we may be unable to anticipate these techniques or detect an incident, assess its severity or impact, react or appropriately respond in a timely manner or implement adequate preventative measures, resulting in potential data loss or other damage to our information technology systems. Given the unpredictability of the timing, nature and scope of information technology disruptions, there can be no assurance that any security procedures and controls that we or our third-party partners and service providers have implemented will be sufficient to prevent cyber-attacks from occurring. The latency of a compromise is often measured in months, but could be years, and we may not be able to detect a compromise in a timely manner.

We and certain of our service providers and vendors are from time to time subject to cyberattacks and cybersecurity incidents. While we do not believe that we have experienced any significant system failure or other cybersecurity incident to date, if such an event were to occur and cause interruptions in our operations or result in the unauthorized disclosure of, access to or other processing of personal information or individually identifiable health information (potentially violating certain privacy laws), other otherwise adversely affect the confidentiality, integrity and availability of our information systems or any information stored therein, it could result in a material disruption of our development programs and our business operations, whether due to a loss of our trade secrets or other similar disruptions. Some of the federal, state and foreign government requirements include obligations of companies to notify individuals of cybersecurity breaches involving particular personal information, which could result from breaches experienced by us or by our vendors, contractors, or organizations with which we have formed strategic relationships.

Any security breach or other incident, whether actual or perceived, could impact our reputation, cause us to incur significant costs, including legal expenses, harm customer confidence, hurt our expansion into new markets, cause us to incur remediation costs, or cause us to lose existing customers. For example, the loss of clinical trial data from clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. We also rely on third parties to manufacture our product candidates, and similar events relating to their computer systems could also have a material adverse effect on our business. We have also outsourced elements of our information technology infrastructure, and as a result a number of third-party vendors may or could have access to our confidential information. There can no assurance that our cybersecurity risk management program and processes, including our policies, controls or procedures, will be fully implemented, complied with or effective in protecting our information systems and personal or confidential Information. To the extent that any actual or perceived disruption or cybersecurity incident were to jeopardize the confidentiality, integrity, or availability of our systems (or those of our third-party collaborators, service providers, vendors, contractors or consultants) or were to result in a loss of or accidental, unlawful or unauthorized access to, use of, release of, or other processing of personal confidential or proprietary information, or damage to, our data or applications, we could incur liability, the further development and commercialization of our product candidates could be delayed, and we could be subject to significant fines, penalties or liabilities for any noncompliance with certain privacy and cybersecurity laws. Further, our insurance coverage may not be sufficient to cover the financial, legal, business or reputational losses that may result from an interruption or breach of our systems, or that applicable insurance will be available to us in the future on economically reasonable terms or at all.

Our business is subject to risks arising from COVID-19 and other epidemic diseases.

The COVID-19 worldwide pandemic presented substantial public health and economic challenges and affected our employees, patients, physicians and other healthcare providers, communities and business operations, as well as the US and global economies and financial markets. To date we have not experienced material disruptions in our business operations.

However, COVID-19 and any future epidemic diseases may cause disruptions that could severely impact our business, clinical trials, preclinical studies and financial condition, including:

- delays or difficulties in enrolling patients in clinical trials;
- delays or difficulties in clinical site initiation, including difficulties in recruiting clinical site investigators and staff;
- interruption of, or delays in receiving, supplies of our product candidates from our CMOs due to staffing shortages, production slowdowns or stoppages and disruptions in delivery systems;
- interruptions or delays in clinical trials or preclinical studies due to restricted or limited operations at our laboratory facility or those of our outsourced service providers;
- limitations on employee resources that would otherwise be focused on the conduct of our clinical trials or preclinical studies due to sickness of employees or their families or the desire of employees to avoid contact with large groups of people, or other staffing shortages as a result of remote working requirements or otherwise;
- delays in clinical sites receiving the supplies and materials needed to conduct our clinical trials and interruption in global shipping that may affect the transport of clinical trial materials;
- diversion of healthcare resources away from the conduct of clinical trials, including the diversion of hospitals serving as our clinical trial sites and hospital staff supporting the conduct of our clinical trials;

- interruption of key clinical trial activities, such as clinical trial site monitoring and source data verification, due to limitations on travel imposed or recommended by federal or state governments, employers and others or interruption of clinical trial subject visits and study procedures, which may impact the integrity of subject data and clinical study endpoints;
- interruption or delays in the operations of the FDA or other regulatory authorities, which may impact review and approval timelines;
- delays in receiving authorization from local regulatory authorities to initiate our planned clinical trials;
- changes in local regulations which may require us to change the ways in which our clinical trials are conducted, which may result in unexpected costs, or to discontinue such clinical trials altogether;
- delays in necessary interactions with local regulators, ethics committees, and other important agencies and contractors due to limitations in employee resources or forced furlough of government employees;
- refusal of the FDA to accept data from clinical trials in affected geographies outside the United States; and
- patent office interruption or delays in our ability to timely secure patent coverage for our product candidates.

To the extent an epidemic disease adversely affects our business and financial results, it may also have the effect of heightening many of the other risks described in this section. In addition, if in the future there is an outbreak of another highly infectious or contagious disease or other health concern, we may be subject to similar risks as previously posed by the COVID-19 pandemic.

Our business could be affected by litigation, government investigations and enforcement actions.

We currently operate in a number of jurisdictions in a highly regulated industry and we could be subject to litigation, government investigation and enforcement actions on a variety of matters in the United States or foreign jurisdictions, including, without limitation, intellectual property, regulatory, product liability, environmental, whistleblower, false claims, privacy, anti-kickback, anti-bribery, securities, commercial, employment and other claims and legal proceedings which may arise from conducting our business. Any determination that our operations or activities are not in compliance with existing laws or regulations could result in the imposition of fines, civil and criminal penalties, equitable remedies, including disgorgement, injunctive relief and/or other sanctions against us, and remediation of any such findings could have an adverse effect on our business operations.

Legal proceedings, government investigations and enforcement actions can be expensive and time-consuming. An adverse outcome resulting from any such proceeding, investigations or enforcement actions could result in significant damages awards, fines, penalties, exclusion from the federal healthcare programs, healthcare debarment, injunctive relief, product recalls, reputational damage and modifications of our business practices, which could have a material adverse effect on our business and results of operations.

Our employees and independent contractors, including principal investigators, CROs, consultants and vendors, may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

We are exposed to the risk that our employees and independent contractors, including principal investigators, CROs, consultants and vendors may engage in misconduct or other illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or disclosure of unauthorized activities to us that violate: (i) the laws and regulations of the FDA and other similar regulatory requirements, including those laws that require the reporting of true, complete and accurate information to such authorities, (ii) manufacturing standards, including cGMP requirements, (iii) federal and state data privacy, cybersecurity, fraud and abuse and other healthcare laws and regulations in the United States and abroad or (iv) laws that require the true, complete and accurate reporting of financial information or data. Activities subject to these laws also involve the improper use or misrepresentation of information obtained in the course of clinical trials, the creation of fraudulent data in our preclinical studies or clinical trials or illegal misappropriation of drug product, which could result in regulatory sanctions and cause serious harm to our reputation. It is not always possible to identify and deter misconduct by employees and other third parties, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. In addition, we are subject to the risk that a person or government could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business and financial results,

including, without limitation, the imposition of significant civil, criminal and administrative penalties, damages, monetary fines, disgorgements, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, imprisonment, contractual damages, reputational harm, diminished profits and future earnings, additional reporting requirements and oversight if we become subject to a corporate integrity agreement or similar agreement to resolve allegations of non-compliance with these laws and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

We may engage in strategic transactions that could impact our liquidity, increase our expenses and present significant distractions to our management.

From time to time, we may consider strategic transactions, such as acquisitions of companies, asset purchases and out-licensing or in-licensing of intellectual property, products or technologies, similar to our approach in which we in-licensed and acquired certain of our current product candidates and development programs. Additional potential transactions that we may consider in the future include a variety of business arrangements, including spin-offs, strategic partnerships, joint ventures, restructurings, divestitures, business combinations and investments. Any future transactions could increase our near and long-term expenditures, result in potentially dilutive issuances of our equity securities, including our common stock, or the incurrence of debt, contingent liabilities, amortization expenses or acquired in-process research and development expenses, any of which could affect our financial condition, liquidity and results of operations. Future acquisitions may also require us to obtain additional financing, which may not be available on favorable terms or at all. These transactions may never be successful and may require significant time and attention of our management. In addition, the integration of any business that we may acquire in the future may disrupt our existing business and may be a complex, risky and costly endeavor for which we may never realize the full benefits of the acquisition. Accordingly, although there can be no assurance that we will undertake or successfully complete any additional transactions of the nature described above, any additional transactions that we do complete could have a material adverse effect on our business, results of operations, financial condition and prospects.

Our ability to use net operating loss carryforwards and other tax attributes may be limited.

We have incurred substantial losses during our history, do not expect to become profitable in the near future and may never achieve profitability. To the extent that we continue to generate taxable losses, unused losses will, subject to limitations, carry forward to offset future taxable income, if any, until such unused losses expire (if at all). As of December 31, 2023, we had federal, California and other state net operating loss (NOL) carryforwards of $200.9 million, $243.1 million and $2.5 million, respectively.

Federal NOL carryforwards arising in tax years beginning after December 31, 2017 may be carried forward indefinitely. The deductibility of federal NOL carryforwards may be limited. In addition, our NOL carryforwards are subject to review and possible adjustment by the United States Internal Revenue Service and state tax authorities.

Under Section 382 of the Internal Revenue Code of 1986, as amended (IRC), our federal NOL carryforwards may become subject to an annual limitation in the event of certain cumulative changes in the ownership of our company. An “ownership change” pursuant to Section 382 of the IRC generally occurs if one or more stockholders or groups of stockholders who own at least 5% of a company’s stock increase their ownership by more than 50 percentage points over their lowest ownership percentage within a rolling three-year period. Similar rules may apply under state tax laws. We have not yet formally determined the amount of the cumulative change in our ownership resulting from our IPO or other transactions, or any resulting limitations on our ability to utilize our NOL carryforwards and other tax attributes. However, we believe that our ability to utilize our NOL carryforwards and other tax attributes to offset future taxable income or tax liabilities may be limited as a result of ownership changes, including changes related to our IPO. If we earn taxable income, such limitations could result in increased future income tax liability to us and our future cash flows could be adversely affected. We have recorded a full valuation allowance related to our NOL carryforwards and other deferred tax assets due to the uncertainty of the ultimate realization of the future benefits of those assets.

Investors’ expectations of our performance relating to environmental, social and governance factors may impose additional costs and expose us to new risks.

There is an increasing focus from certain investors, employees and other stakeholders concerning corporate responsibility, specifically related to environmental, social and governance factors. Some investors may use these factors to guide their investment strategies and, in some cases, may choose not to invest in us if they believe our policies relating to corporate responsibility are inadequate, including if they believe our policies relating to the Erasca Foundation are inadequate. Third-party providers of corporate responsibility ratings and reports on companies have increased to meet

growing investor demand for measurement of corporate responsibility performance. The criteria by which companies' corporate responsibility practices are assessed may change, which could result in greater expectations of us and cause us to undertake costly initiatives to satisfy such new criteria. If we elect not to or are unable to satisfy such new criteria, investors may conclude that our policies with respect to corporate responsibility are inadequate. We may face reputational damage in the event that our corporate responsibility procedures or standards do not meet the standards set by various constituencies.

Furthermore, if our competitors' corporate responsibility performance is perceived to be greater than ours, potential or current investors may elect to invest with our competitors instead. In addition, in the event that we communicate certain initiatives and goals regarding environmental, social and governance matters, including with respect to the initiatives and goals we established as part of the Erasca Foundation, we could fail, or be perceived to fail, in our achievement of such initiatives or goals, or we could be criticized for the scope of such initiatives or goals. If we fail to satisfy the expectations of investors, employees and other stakeholders or our initiatives are not executed as planned, our reputation and financial results could be materially and adversely affected.

Risks related to our intellectual property

If we are unable to obtain and maintain patent protection for our product candidates, or if the scope of the patent protection obtained is not sufficiently broad, our competitors could develop and commercialize products similar or identical to ours, and our ability to successfully commercialize our product candidates may be adversely affected.

Our success depends in large part on our ability to obtain and maintain patent protection and trade secret protection with respect to our therapeutic programs, proprietary technologies, and their uses. We seek to protect our proprietary position, in part, by filing patent applications in the United States and abroad relating to our product candidates. We also seek to protect our proprietary position by acquiring or in-licensing relevant issued patents or pending applications from third parties. If we or our licensors are unable to obtain or maintain patent protection with respect to our product candidates, our business, financial condition, results of operations and prospects could be materially harmed.

Changes in either the patent laws or their interpretation in the United States and other jurisdictions may diminish our ability to protect our intellectual property, obtain, maintain and enforce our intellectual property rights and, more generally, could affect the value of our intellectual property or narrow the scope of our protection. We cannot predict whether the patent applications we or our licensors are currently pursuing will issue as patents in any particular jurisdiction or whether the claims of any issued patents will provide sufficient protection against competitors or other third parties.

The patent prosecution process is expensive, time-consuming, and complex, and we and our licensors may not be able to file, prosecute, maintain, enforce, or license all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that we or our licensors will fail to identify patentable aspects of our research and development output in time to obtain patent protection. Although we enter into non-disclosure and confidentiality agreements with parties who have access to confidential or patentable aspects of our research and development output, such as our employees, third-party collaborators, CROs, CMOs, consultants, advisors and other third parties, any of these parties may breach the agreements and disclose such output before a patent application is filed, thereby jeopardizing our ability to seek patent protection. In addition, our ability to obtain and maintain valid and enforceable patents depends on whether the differences between our inventions and the prior art allow our inventions to be patentable in light of the prior art. Furthermore, publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. Therefore, we cannot be certain that we or our licensors were the first to invent the inventions claimed in any of our owned or licensed patents or pending patent applications, or that we or our licensors were the first to file for patent protection of such inventions.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain, involves complex legal and factual questions and has been the subject of much litigation in recent years. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are highly uncertain. Our owned and in-licensed patent applications may not result in patents being issued which protect our therapeutic programs and other proprietary technologies we may develop or which effectively prevent others from commercializing competitive technologies and products.

Moreover, the claim coverage in a patent application can be significantly reduced before the patent is granted. Even if our owned and in-licensed patent applications issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors or other third parties from competing with us or otherwise provide us with any competitive advantage. Any patents issuing from our owned and in-licensed patent applications may be challenged, narrowed, circumvented or invalidated by third parties. Consequently, we do not know whether our therapeutic programs and other proprietary technology will be protectable or remain protected by valid and enforceable patents. Even if a patent is granted, our competitors or other third parties may be able to circumvent the patent by developing similar or alternative technologies or products in a non-infringing manner which could materially adversely affect our business, financial condition, results of operations and prospects. In addition, given the amount of time required for the development, testing and regulatory review of our therapeutic programs and eventual product candidates, patents protecting the product candidates might expire before or shortly after such product candidates are commercialized. As a result, our intellectual property may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

The issuance of a patent is not conclusive as to its inventorship, scope, validity, or enforceability and our owned and in-licensed patents may be challenged in the courts or patent offices in the United States and abroad. We may be subject to a third-party pre-issuance submission of prior art to the USPTO or become involved in opposition, derivation, revocation, reexamination, post-grant and inter partes review, or other similar proceedings challenging our patent rights. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate or render unenforceable, our patent rights, allow third parties to commercialize our therapeutic programs and other proprietary technologies we may develop and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third-party patent rights. Such proceedings also may result in substantial cost and require significant time from our scientists and management, even if the eventual outcome is favorable to us.

Moreover, some of our owned and in-licensed patent rights are, and may in the future be, co-owned with third parties. If we are unable to obtain an exclusive license to any such third-party co-owners' interest in such patent rights, such co-owners may be able to license their rights to other third parties, including our competitors, and our competitors could market competing products and technology. In addition, we may need the cooperation of any such co-owners of such patent rights in order to enforce such patent rights against third parties, and such cooperation may not be provided to us. Any of the foregoing could have a material adverse effect on our competitive position, business, financial conditions, results of operations, and prospects.

Furthermore, our owned and in-licensed patent rights may be subject to a reservation of rights by one or more third parties. For example, the research resulting in certain of our patent rights and technology was funded in part by the US government. As a result, the government may have certain rights, or march-in rights, to such patent rights and technology. When new technologies are developed with government funding, the government generally obtains certain rights in any resulting patents, including a non-exclusive license authorizing the government to use the invention for non-commercial purposes. These rights may permit the government to disclose our confidential information to third parties and to exercise march-in rights to use or allow third parties to use our licensed technology. The government can exercise its march-in rights if it determines that action is necessary because we fail to achieve practical application of the government-funded technology, because action is necessary to alleviate health or safety needs, to meet requirements of federal regulations, or to give preference to US industry. In addition, our rights in such inventions may be subject to certain requirements to manufacture products embodying such inventions in the United States. Any exercise by the government of such rights could harm our competitive position, business, financial condition, results of operations and prospects.

We may not be able to protect our intellectual property and proprietary rights throughout the world.

Filing, prosecuting and defending patents on our product candidates in all countries throughout the world would be prohibitively expensive, and the laws of foreign countries may not protect our intellectual property rights to the same extent as the laws of the United States. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our intellectual property in and into the United States or other jurisdictions. Competitors may use our intellectual property in jurisdictions where we have not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where we have patent protection but enforcement is not as strong as that in the United States. These products may compete with our products, and our owned and in-licensed patents or other intellectual property rights may not be effective or sufficient to prevent them from competing. Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents, trade secrets and other intellectual property protection, particularly those relating to biotechnology products, which could make it difficult for us to

stop the infringement of our owned and in-licensed patents or marketing of competing products in violation of our intellectual property and proprietary rights generally. In addition, some jurisdictions, such as Europe, Japan and China, may have a higher standard for patentability than in the United States, including, for example, the requirement of claims having literal support in the original patent filing and the limitation on using supporting data that is not in the original patent filing. Under those heightened patentability requirements, we may not be able to obtain sufficient patent protection in certain jurisdictions even though the same or similar patent protection can be secured in the United States and other jurisdictions.

Proceedings to enforce our intellectual property and proprietary rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our owned and in-licensed patents at risk of being invalidated or interpreted narrowly, could put our owned and in-licensed patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property and proprietary rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop.

Many countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In addition, many countries limit the enforceability of patents against government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of such patent. If we are forced to grant a license to third parties with respect to any patents relevant to our business, our competitive position may be impaired, and our business, financial condition, results of operations and prospects may be adversely affected.

In addition, geo-political actions in the US and in foreign countries could increase the uncertainties and costs surrounding the prosecution or maintenance of our patent applications or those of any current or future licensors and the maintenance, enforcement or defense of our issued patents or those of any current or future licensors.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment, and other requirements imposed by government patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

The USPTO and various non-US government agencies require compliance with several procedural, documentary, fee payment and other similar provisions during the patent application process. In some circumstances, we are dependent on our licensors to take the necessary action to comply with these requirements with respect to our licensed intellectual property. For example, periodic maintenance fees, renewal fees, annuity fees, and various other government fees on patents and applications will be due to be paid to the USPTO and various government patent agencies outside of the United States over the lifetime of our owned or licensed patents and applications. In certain circumstances, we rely on our licensing partners to pay these fees due to US and non-US patent agencies. In some cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. There are situations, however, in which non-compliance can result in abandonment or lapse of the patent or patent application, resulting in a partial or complete loss of patent rights in the relevant jurisdiction. In such an event, potential competitors might be able to enter the market with similar or identical products or technology, which could have a material adverse effect on our business, financial condition, results of operations, and prospects.

The USPTO and various non-US. government agencies require compliance with certain foreign filing requirements during the patent application process. For example, in some countries, including the US, China, India and some European countries, a foreign filing license is required before certain patent applications are filed. The foreign filing license requirements vary by country and depend on various factors including where the inventive activity occurred, citizenship status of the inventors, the residency of the inventors and the invention owner, the place of business for the invention owner and the nature of the subject matter to be disclosed (e.g., items related to national security or national defense). In some cases, a foreign filing license may be obtained retroactively in accordance with the applicable rules. There are situations, however, in which non-compliance can result in abandonment of a pending patent application or can be grounds for revoking or invalidating an issued patent, resulting in the loss of patent rights in the relevant jurisdiction. In such an event, potential competitors might be able to enter the relevant markets with similar or identical products or technology, which could have a material adverse effect on our business, financial condition, results of operations, and prospects. We are also dependent on our licensors to take the necessary actions to comply with these requirements with respect to our licensed intellectual property. The Indian patent application covering ERAS-007 as composition of matter was filed without obtaining a foreign filing license from the Indian Patent Office. As such, any patent issuing from the

pending patent application in India may be vulnerable to revocation by the Indian Patent Office or invalidity or unenforceability attacks by third parties.

Changes in patent law could diminish the value of patents in general, thereby impairing our ability to protect our products.

Changes in either the patent laws or interpretation of the patent laws in the United States or other countries could increase the uncertainties and costs surrounding the prosecution of patent applications and the enforcement, defense and term of issued patents. In the United States, assuming that other requirements for patentability are met, prior to March 2013, in the United States, the first to invent the claimed invention was entitled to the patent, while outside the United States, the first to file a patent application was entitled to the patent. After March 2013, under the Leahy-Smith America Invents Act (the America Invents Act) enacted in September 2011, the United States transitioned to a first inventor to file system in which, assuming that other requirements for patentability are met, the first inventor to file a patent application will be entitled to the patent on an invention regardless of whether a third party was the first to invent the claimed invention. A third party that files a patent application in the USPTO after March 2013, but before us or our licensors could therefore be awarded a patent covering an invention of ours or our licensors even if we or our licensors had made the invention before it was made by such third party. This will require us to be cognizant going forward of the time from invention to filing of a patent application. Since patent applications in the United States and most other countries are confidential for a period of time after filing or until issuance, we cannot be certain that we or our licensors were the first to either: (i) file any patent application related to our therapeutic programs and other proprietary technologies we may develop, or (ii) invent any of the inventions claimed in our patent applications.

The America Invents Act also includes a number of significant changes to US patent law with respect to patent applications filed after March 16, 2013, that affect the way patent applications will be prosecuted and also may affect patent litigation. These include allowing third party submission of prior art to the USPTO during patent prosecution and additional procedures to attack the validity of a patent by USPTO administered post-grant proceedings, including post-grant review, inter partes review and derivation proceedings. Because of a lower evidentiary standard in USPTO proceedings compared to the evidentiary standard in United States federal courts necessary to invalidate a patent claim, a third party could potentially provide evidence in a USPTO proceeding sufficient for the USPTO to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a district court action. Accordingly, a third party may attempt to use the USPTO procedures to invalidate our owned and in-licensed patent claims that would not have been invalidated if first challenged by the third party as a defendant in a district court action.

In addition, the patent positions of companies in the development and commercialization of biologics and pharmaceuticals are particularly uncertain. Recent US Supreme Court rulings have narrowed the scope of patent protection available in certain circumstances and weakened the rights of patent owners in certain situations. This combination of events has created uncertainty with respect to the validity and enforceability of patents, once obtained. Depending on future actions by the US Congress, the federal courts and the USPTO, and similar authorities in foreign jurisdictions, the laws and regulations governing patents could change in unpredictable ways that could have a material adverse effect on our existing patent portfolio and our ability to protect and enforce our intellectual property in the future. For example, in June 2023, the European Patent Package (the EU Patent Package) regulations were implemented with the goal of providing a single pan-European Unitary Patent and a new European Unified Patent Court (the UPC) for litigation involving European patents. As a result, all European patents, including those issued prior to ratification of the EU Patent Package, will by default automatically fall under the jurisdiction of the UPC. We may opt our European patents out of the UPC during first seven years of the UPC's existence, but doing so may preclude us from realizing the benefits of the new unified court. Moreover, if we do not meet all of the formalities and requirements for opt-out under the UPC, our current or future European patents could remain under the jurisdiction of the UPC. It is uncertain how the UPC will impact granted European patents in the biotechnology and pharmaceutical industries and our European patent applications, if issued, could be challenged in the UPC. The UPC will provide our competitors with a new forum to centrally revoke our European patents, and allow for the possibility of a competitor to obtain pan-European injunctions. Such a loss of patent protection could have a material adverse impact on our business and our ability to commercialize our technology and product candidates and, resultantly, on our business, financial condition, prospects and results of operations.

Issued patents covering our product candidates could be found invalid or unenforceable if challenged in court or before administrative bodies in the United States or abroad.

If we or our licensors initiated legal proceedings against a third party to enforce a patent covering our product candidates, the defendant could counterclaim that such patent is invalid or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could

be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, non-enablement lack of sufficient written description or obviousness-type double patenting. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant information from the USPTO, or made a misleading statement, during prosecution. Third parties may raise claims challenging the validity or enforceability of a patent before administrative bodies in the United States or abroad, even outside the context of litigation. Such mechanisms include re-examination, post-grant review, inter partes review, derivation proceedings, and equivalent proceedings in foreign jurisdictions (e.g., opposition proceedings). Such proceedings could result in the revocation of, cancellation of or amendment to our owned and in-licensed patents in such a way that they no longer cover our product candidates. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to the validity question, for example, we cannot be certain that there is no invalidating prior art, of which we or our licensing partners and the patent examiner were unaware during prosecution. If a third party were to prevail on a legal assertion of invalidity or unenforceability, we would lose at least part, and perhaps all, of the patent protection on our product candidates. Such a loss of patent protection would have a material adverse impact on our business, financial condition, results of operations and prospects.

Patent terms may be inadequate to protect our competitive position on products and product 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 US non-provisional or international patent application 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 product candidates are obtained, once the patent has expired, we may be vulnerable to competition from competitive products, including generics or biosimilars. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such product candidates might expire before or shortly after such product candidates are commercialized. As a result, our owned and in-licensed patent portfolio may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

If we do not obtain patent term extension for our product candidates, our business may be materially harmed.

Depending upon the timing, duration and specifics of any FDA marketing approval of any of our product candidates, one or more of our owned and in-licensed issued US patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Action of 1984 (Hatch-Waxman Amendments). The Hatch-Waxman Amendments permit a patent term extension of up to five years as compensation for patent term lost during the FDA regulatory review process. A patent term extension cannot extend the remaining term of a patent beyond a total of 14 years from the date of product approval, only one patent may be extended and only those claims covering the approved drug, a method for using it or a method for manufacturing it may be extended. Similar patent term restoration provisions to compensate for commercialization delay caused by regulatory review are also available in certain foreign jurisdictions, such as in Europe under Supplemental Protection Certificate. However, we may not be granted an extension because of, for example, failing to exercise due diligence during the testing phase or regulatory review process, failing to apply within applicable deadlines, failing to apply prior to expiration of relevant patents, or otherwise failing to satisfy applicable requirements. Moreover, the applicable time period or the scope of patent protection afforded could be less than we request. If we are unable to obtain patent term extension or term of any such extension is less than we request, our competitors may obtain approval of competing products following our patent expiration, and our business, financial condition, results of operations and prospects could be materially harmed.

We may be subject to claims challenging the inventorship of our patents and other intellectual property.

We may be subject to claims that former employees, collaborators or other third parties have an interest in our patent rights, trade secrets, or other intellectual property as an inventor or co-inventor. For example, we may have inventorship disputes arise from conflicting obligations of consultants or others who are involved in developing our therapeutic programs and other proprietary technologies we may develop. Litigation may be necessary to defend against these and other claims challenging inventorship or our patent rights, trade secrets or other intellectual property. If we 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 therapeutic programs and other proprietary technologies we may develop. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to our management and other employees. Any of the foregoing could have a material adverse effect on our business, financial condition, results of operations and prospects.

If we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be harmed.

In addition to seeking patent protection for our product candidates, we also rely on trade secrets and confidentiality agreements to protect our unpatented know-how, technology, and other proprietary information and to maintain our competitive position. We seek to protect these trade secrets and other proprietary technology, in part, by entering into non-disclosure and confidentiality agreements with parties who have access to them, such as our employees, third-party collaborators, CROs, CMOs, consultants, advisors and other third parties. We also enter into confidentiality and invention or patent assignment agreements with our employees and consultants. We cannot guarantee that we have entered into such agreements with each party that may have or have had access to our trade secrets or proprietary technology and processes. Despite these efforts, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets, and we may need to share our trade secrets and proprietary know-how with current or future partners, collaborators, contractors and others located in countries at heightened risk of theft of trade secrets, including through direct intrusion by private parties or foreign actors, and those affiliated with or controlled by state actors. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor or other third party, we would have no right to prevent them from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to or independently developed by a competitor or other third party, our competitive position would be materially and adversely harmed.

We may be subject to claims that third parties have an ownership interest in our trade secrets. For example, we may have disputes arise from conflicting obligations of our employees, consultants or others who are involved in developing our product candidate. Litigation may be necessary to defend against these and other claims challenging ownership of our trade secrets. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable trade secret rights, such as exclusive ownership of, or right to use, trade secrets that are important to our therapeutic programs and other proprietary technologies we may develop. Such an outcome could have a material adverse effect on our business. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to our 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 may be subject to claims that our employees, consultants or advisors have wrongfully used or disclosed alleged trade secrets of their current or former employers or claims asserting ownership of what we regard as our own intellectual property.

Some of our employees, consultants and advisors are currently or were previously employed at universities or other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees, consultants and advisors do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or these individuals have used or disclosed intellectual property, including trade secrets or other proprietary information, of any such individual's current or former employer. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to our management.

In addition, while it is our policy to require our employees and contractors who may be involved in the conception or development of intellectual property to execute agreements assigning such intellectual property to us, we may be unsuccessful in executing such an agreement with each party who, in fact, conceives or develops intellectual property that we regard as our own. The assignment of intellectual property rights may not be self-executing, or the assignment agreements may be breached, and we may be forced to bring claims against third parties, or defend claims that they may bring against us, to determine the ownership of what we regard as our intellectual property. Such claims could have a material adverse effect on our business, financial condition, results of operations and prospects.

We may not identify relevant third-party patents or may incorrectly interpret the relevance, scope or expiration of a third-party patent, which might adversely affect our ability to develop and market our products and product candidates.

We cannot guarantee that any of our patent searches or analyses, including the identification of relevant patents, the scope of patent claims or the expiration of relevant patents, are complete or thorough, nor can we be certain that we have identified each and every third-party patent and pending patent application in the United States and abroad that is relevant to or necessary for the commercialization of our current and future products and product candidates in any jurisdiction. The scope of a patent claim is determined by an interpretation of the law, the written disclosure in a patent and the patent's prosecution history. Our interpretation of the relevance or the scope of a patent or a pending patent application may be incorrect, which may negatively impact our ability to market our products. We may incorrectly determine that our products or product candidates are not covered by a third-party patent or may incorrectly predict whether a third party's pending patent application will issue with claims of relevant scope. Our determination of the expiration date of any patent in the United States or abroad that we consider relevant may be incorrect, and our failure to identify and correctly interpret relevant patents may negatively impact our ability to develop and market our products. Any of the foregoing could have a material adverse effect on our business, financial condition, results of operations and prospects.

Third-party claims of intellectual property infringement, misappropriation or other violations against us or our collaborators may prevent or delay the development and commercialization of our product candidates.

Our commercial success depends in part on our ability to avoid infringing, misappropriating and otherwise violating the patents and other intellectual property rights of third parties. There is a substantial amount of complex litigation involving patents and other intellectual property rights in the biotechnology and pharmaceutical industries, as well as administrative proceedings for challenging patents, including interference, derivation and reexamination proceedings before the USPTO or oppositions and other comparable proceedings in foreign jurisdictions. As discussed above, recently, due to changes in US law referred to as patent reform, new procedures including inter partes review and post-grant review have also been implemented. As stated above, this reform adds uncertainty to the possibility of challenge to our owned and in-licensed patents in the future.

Numerous US and foreign issued patents and pending patent applications owned by third parties exist in the fields in which we plan to commercialize our therapeutic and diagnostic programs and in which we are developing other proprietary technologies. As the biotechnology and pharmaceutical industries expand and more patents are issued, and as we gain greater visibility and market exposure as a public company, the risk that our therapeutic and diagnostic programs and commercializing activities may give rise to claims of infringement of the patent rights of others increases. We cannot assure you that our therapeutic programs and other proprietary technologies we may develop will not infringe existing or future patents owned by third parties. We may not be aware of patents that have already been issued and that a third party, including a competitor in the fields in which we are developing our therapeutic programs, might assert as infringed by us. It is also possible that patents owned by third parties of which we are aware, but which we do not believe we infringe or that we believe we have valid defenses to any claims of patent infringement, could be found to be infringed by us. It is not unusual that corresponding patents issued in different countries have different scopes of coverage, such that in one country a third-party patent does not pose a material risk, but in another country, the corresponding third-party patent may pose a material risk to our products or product candidates. As such, we monitor third-party patents in the relevant pharmaceutical markets. In addition, because patent applications can take many years to issue, there may be currently pending patent applications that may later result in issued patents that we may infringe.

In the event that any third-party claims that we infringe their patents or that we are otherwise employing their proprietary technology without authorization and initiates litigation against us, even if we believe such claims are without merit, a court of competent jurisdiction could hold that such patents are valid, enforceable and infringed by us. Defense of infringement claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of management and other employee resources from our business, and may impact our reputation. In the event of a successful claim of infringement against us, we may be enjoined from further developing or commercializing the infringing products or technologies. In addition, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, obtain one or more licenses from third parties, pay royalties and/or redesign our infringing products or technologies, which may be impossible or require substantial time and monetary expenditure. Such licenses may not be available on commercially reasonable terms or at all. Even if we are able to obtain a license, the license would likely obligate us to pay license fees or royalties or both, and the rights granted to us might be nonexclusive, which could result in our competitors gaining access to the same intellectual property. If we are unable to obtain a necessary license to a third-party patent on commercially reasonable terms, we may be unable to commercialize the infringing products or technologies or such commercialization efforts may be significantly delayed, which could in turn significantly harm our

business. In addition, we may in the future pursue patent challenges with respect to third-party patents, including as a defense against the foregoing infringement claims. The outcome of such challenges is unpredictable.

Even if resolved in our favor, the foregoing proceedings could be very expensive, particularly for a company of our size, and time-consuming. Such proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to conduct such proceedings adequately. Some of our competitors may be able to sustain the costs of litigation or administrative proceedings more effectively than we can because of greater financial resources. Such legal proceedings may also absorb significant time of our technical and management personnel and distract them from their normal responsibilities. Uncertainties resulting from such proceedings could impair our ability to compete in the marketplace. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. The occurrence of any of the foregoing could have a material adverse effect on our business, financial condition or results of operations.

We may become involved in lawsuits to protect or enforce our owned and in-licensed patents and other intellectual property rights, which could be expensive, time-consuming and unsuccessful.

Third parties, such as a competitor, may infringe our patent rights. In an infringement proceeding, a court may decide that a patent owned by us is invalid or unenforceable or may refuse to stop the other party from using the invention at issue on the grounds that the patent does not cover the technology in question. In addition, our patent rights may become involved in inventorship, priority or validity disputes. To counter or defend against such claims can be expensive and time-consuming. An adverse result in any litigation proceeding could put our patent rights at risk of being invalidated or interpreted narrowly. 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.

Even if resolved in our favor, litigation or other legal proceedings relating to intellectual property claims may cause us to incur significant expenses and could distract our personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments, and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to conduct such litigation or proceedings adequately. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources and more mature and developed intellectual property portfolios. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace.

If our trademarks and trade names are not adequately protected, then we may not be able to build name recognition in our markets of interest and our business may be adversely affected.

Our registered or unregistered trademarks or trade names may be challenged, infringed, circumvented or declared generic or determined to be infringing on other marks. During trademark registration proceedings, we may receive rejections of our applications by the USPTO or in other foreign jurisdictions. Although we are given an opportunity to respond to such rejections, we may be unable to overcome them. In addition, in the USPTO and in comparable agencies in many foreign jurisdictions, third parties are given an opportunity to oppose pending trademark applications and to seek to cancel registered trademarks. Opposition or cancellation proceedings may be filed against our trademarks, which may not survive such proceedings. Moreover, any name we have proposed to use with our product candidate in the United States must be approved by the FDA, regardless of whether we have registered it, or applied to register it, as a trademark. Similar requirements exist in Europe. The FDA typically conducts a review of proposed product names, including an evaluation of potential for confusion with other product names. If the FDA or an equivalent administrative body in a foreign jurisdiction objects to any of our proposed proprietary product names, we may be required to expend significant additional resources in an effort to identify a suitable substitute name that would qualify under applicable trademark laws, not infringe the existing rights of third parties and be acceptable to the FDA. Furthermore, in many countries, owning and maintaining a trademark registration may not provide an adequate defense against a subsequent infringement claim asserted by the owner of a senior trademark.

We may not be able to protect our rights to these trademarks and trade names, which we need to build name recognition among potential partners or customers in our markets of interest. At times, competitors or other third parties may adopt trade names or trademarks similar to ours, thereby impeding our ability to build brand identity and possibly leading to market confusion. In addition, there could be potential trade name or trademark infringement claims brought by owners of other registered trademarks or trademarks that incorporate variations of our registered or unregistered trademarks or trade names. Over the long term, if we are unable to establish name recognition based on our trademarks and trade names, then we may not be able to compete effectively and our business may be adversely affected. Our efforts to enforce or protect our proprietary rights related to trademarks, trade names, domain name or other intellectual property may be ineffective and could result in substantial costs and diversion of resources and could adversely affect our business, financial condition, results of operations and prospects.

Intellectual property rights do not necessarily address all potential threats.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations and may not adequately protect our business or permit us to maintain our competitive advantage. For example:

- others may be able to make products that are similar to our product candidates or utilize similar technology but that are not covered by the claims of the patents that we license or may own;
- we or our licensors or collaborators might not have been the first to make the inventions covered by our current or future patent applications;
- we or our licensors or collaborators might not have been the first to file patent applications covering our inventions;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;
- it is possible that the pending and future patent applications we own or in-license will not lead to issued patents;
- issued patents that we own or in-license may be held invalid or unenforceable, including as a result of legal challenges by our competitors or other third parties;
- our competitors or other third parties might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop additional proprietary technologies that are patentable;
- we may fail to identify potential patentable subject matter and/or may fail to file on it;
- the patents of others may harm our business; and
- we may choose not to file for patent protection in order to maintain certain trade secrets or know-how, and a third party may subsequently file a patent application covering such intellectual property.

Should any of the foregoing occur, it could adversely affect our business, financial condition, results of operations and prospects.

We partially depend on intellectual property licensed from third parties, and our licensors may not always act in our best interest. If we fail to comply with our obligations under our intellectual property licenses, if the licenses are terminated or if disputes regarding these licenses arise, we could lose significant rights that are important to our business.

We are dependent, in part, on patents, know-how and proprietary technology licensed from others. We are a party to a number of license agreements under which we are granted rights to intellectual property that are important to our business and we may enter into additional license agreements in the future. Our existing license agreements impose, and we expect that any future license agreements where we in-license intellectual property, will impose on us, various development, regulatory and/or commercial diligence obligations, payment of milestones and/or royalties and other obligations. If we fail to comply with our obligations under these agreements, or we are subject to bankruptcy-related proceedings, the licensor may have the right to terminate the license, in which event we would not be able to develop or market products covered by the license.

If we or our licensors fail to adequately protect our licensed intellectual property, our ability to commercialize product candidates could suffer. We do not have complete control over the maintenance, prosecution and litigation of our in-licensed patents and patent applications and may have limited control over future intellectual property that may be in-licensed. For example, we cannot be certain that activities such as the maintenance and prosecution by our licensors have been or will be conducted in compliance with applicable laws and regulations or will result in valid and enforceable patents and other intellectual property rights. It is possible that our licensors' infringement proceedings or defense activities may be less vigorous than had we conducted them ourselves or may not be conducted in accordance with our best interests.

In addition, the agreements under which we license intellectual property or technology from third parties are complex, and certain provisions in such agreements may be susceptible to multiple interpretations. 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 patents, know-how and proprietary technology, or increase what we believe to be our financial or other obligations under the relevant agreement. Disputes that may arise between us and our licensors regarding intellectual property subject to a license agreement could include disputes regarding:

- the scope of rights granted under the license agreement and other interpretation-related issues;
- whether and the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- our right to sublicense patent and other rights to third parties under collaborative development relationships;
- our diligence obligations with respect to the use of the licensed technology in relation to our development and commercialization of our product candidates and what activities satisfy those diligence obligations; and
- the inventorship and ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and us and our partners.

If disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on reasonable terms, we may be unable to successfully develop and commercialize the affected technology or product candidates. As a result, any termination of or disputes over our intellectual property licenses could result in the loss of our ability to develop and commercialize our product candidates, or we could lose other significant rights, any of which could have a material adverse effect on our business, financial condition, results of operations and prospects.

For example, our agreements with certain of our third-party research partners provide that improvements developed in the course of our relationship may be owned solely by either us or our third-party research partner, or jointly between us and the third party. If we determine that rights to such improvements owned solely by a research partner or other third party with whom we collaborate are necessary to commercialize our product candidates or maintain our competitive advantage, we may need to obtain a license from such third party in order to use the improvements and continue developing, manufacturing or marketing our product candidates. We may not be able to obtain such a license on an exclusive basis, on commercially reasonable terms, or at all, which could prevent us from commercializing our product candidates or allow our competitors or others the chance to access technology that is important to our business. We also may need the cooperation of any co-owners of our intellectual property in order to enforce such intellectual property against third parties, and such cooperation may not be provided to us.

We may not be successful in obtaining or maintaining necessary rights to product components and processes for our development pipeline through acquisitions and in-licenses.

The growth of our business may depend in part on our ability to acquire, in-license or use third-party proprietary rights. For example, our product candidates may require specific formulations to work effectively and efficiently, we may develop product candidates containing our compounds and pre-existing pharmaceutical compounds, or we may be required by the FDA or comparable foreign regulatory authorities to provide a companion diagnostic test or tests with our product candidates, any of which could require us to obtain rights to use intellectual property held by third parties. In addition, with respect to any patents we may co-own with third parties, we may require licenses to such co-owner's interest to such patents. We may be unable to acquire or in-license any compositions, methods of use, processes or other third-party intellectual property rights from third parties that we identify as necessary or important to our business operations. In addition, we may fail to obtain any of these licenses at a reasonable cost or on reasonable terms, if at all. Were that to happen, we may need to cease use of the compositions or methods covered by those third-party intellectual property

rights, and may need to seek to develop alternative approaches that do not infringe on those intellectual property rights, which may entail additional costs and development delays, even if we were able to develop such alternatives, which may not be feasible. Even if we are able to obtain a license, it may be non-exclusive, which means that our competitors may also receive access to the same technologies licensed to us. In that event, we may be required to expend significant time and resources to develop or license replacement technology.

Additionally, we sometimes collaborate with academic institutions to accelerate our preclinical research or development under written agreements with these institutions. In certain cases, these institutions provide us with an option to negotiate a license to any of the institution's rights in technology resulting from the collaboration. Even if we hold such an option, we may be unable to negotiate a license from the institution within the specified timeframe or under terms that are acceptable to us. If we are unable to do so, the institution may offer the intellectual property rights to others, potentially blocking our ability to pursue our program.

The licensing and acquisition of third-party intellectual property rights is a competitive area, and companies that may be more established or have greater resources than we do may also be pursuing strategies to license or acquire third-party intellectual property rights that we may consider necessary or attractive in order to commercialize our product candidates. More established companies may have a competitive advantage over us due to their size, cash resources and greater clinical development and commercialization capabilities. In addition, companies that perceive us to be a competitor may be unwilling to assign or license rights to us. There can be no assurance that we will be able to successfully complete these types of negotiations and ultimately acquire the rights to the intellectual property surrounding the additional product candidates that we may seek to develop or market. If we are unable to successfully obtain rights to required third-party intellectual property or to maintain the existing intellectual property rights we have, we may have to abandon development of certain programs and our business financial condition, results of operations and prospects could suffer.

We and our service providers may be subject to a variety of data privacy and security laws and contractual obligations, which could increase compliance costs and our actual or perceived failure to comply with them could subject us to potentially significant fines or penalties, harm our reputation and otherwise adversely affect our business, results of operations, and financial condition.

We maintain a large quantity of sensitive information, including confidential business and health-related information in connection with our preclinical studies, and are subject to laws and regulations governing the privacy and security of such information. The global data protection landscape is rapidly evolving, and we may be affected by or subject to new, amended or existing laws and regulations in the future, including as our operations continue to expand or if we operate in foreign jurisdictions. This evolution may create uncertainty in our business, and could affect our ability to operate in certain jurisdictions or to collect, store, transfer use and share personal information, necessitate the acceptance of more onerous obligations in our contracts, result in liability or impose additional costs on us. The cost of compliance with these laws, regulations and standards is high and is likely to increase in the future. Any failure or perceived failure by us to comply with federal, state or foreign laws or regulations, our internal policies and procedures or our contracts governing our processing of personal information could result in negative publicity, government investigations and enforcement actions, claims by third parties and damage to our reputation, any of which could have a material adverse effect on our business, results of operation, and financial condition.

In the United States, there are numerous federal and state data privacy and security laws and regulations governing the collection, use, disclosure and protection of personal information, including health information privacy laws, security breach notification laws and consumer protection laws. Each of these laws is subject to varying interpretations and constantly evolving. By way of example, HIPAA imposes privacy and security requirements and breach reporting obligations upon "covered entities" (health plans, health care clearinghouses and certain health care providers), and their respective business associates and subcontractors, individuals or entities that create, receive, maintain or transmit protected health information in connection with providing a service for or on behalf of a covered entity, as well as their covered subcontractors. We do not believe that we are currently acting as a covered entity or business associate under HIPAA and thus are not directly subject to its requirements or penalties. However, we may obtain health information from third parties (including research institutions from which we obtain clinical trial data) that are subject to privacy and security requirements under HIPAA. Depending on the facts and circumstances, we could be subject to significant penalties if we violate HIPAA.

In addition, certain states have also adopted comprehensive and health-specific data privacy and security laws and regulations governing the privacy, processing and protection of personal information, some of which are more stringent than HIPAA. For example, the California Consumer Privacy Act (CCPA), which went into effect on January 1, 2020, imposes a range of obligations on covered businesses that process personal information about California residents. The

CCPA provides for civil penalties for violations, as well as a private right of action for certain data breaches, which may increase our compliance costs and potential liability, including due to a new California data protection agency authorized to enforce the CCPA in addition to the Attorney General. Similar laws are already in effect in other states, including Virginia, Utah, Connecticut and Colorado, and have been enacted or proposed in other states and at the federal level, reflecting a trend toward more stringent privacy-related regulation in the United States. The enactment of such laws creates a patchwork of overlapping, but different and potentially conflicting, requirements that may make compliance challenging. Furthermore, the FTC and many state Attorneys General continue to enforce federal and state consumer protection laws against companies in relation to a variety of data privacy and security issues. In the event that we are subject to HIPAA, the CCPA, or similar state data privacy laws, compliance will likely involve significant expenditure and resources, and any failure or perceived failure to comply with the requirements of these laws could adversely affect our business, results of operations, and financial condition.

In Europe, the European Union General Data Protection Regulation (EU GDPR) and the United Kingdom General Data Protection Regulation and Data Protection Act (UK GDPR and together with the EU GDPR, GDPR) govern the collection, use, disclosure, transfer or other processing of personal information of individuals within the EEA.

In addition, the GDPR increases the scrutiny of transfers of personal data from the EEA and UK to the US and other jurisdictions that the European Commission does not recognize as having “adequate” data protection laws. Reliance on standard contractual clauses (SCCs) alone may not be sufficient in all circumstances, and we expect the existing legal complexity and uncertainty regarding international personal data transfers, in particular to the US, to continue. As regulatory guidance on personal data export mechanisms, including circumstances where the SCCs cannot be used, and/or start taking enforcement action, we could suffer additional costs, complaints and/or regulatory investigations or fines, and/or if we are otherwise unable to transfer personal data between and among countries and regions in which we operate, it could affect the manner in which we provide our services, the geographical location or segregation of our relevant systems and operations, and could adversely affect our business, results of operations, and financial condition.

Although we work to comply with applicable laws, regulations and standards, our contractual obligations and other legal obligations, these requirements are evolving and may be modified, interpreted and applied in an inconsistent manner from one jurisdiction to another, and may conflict with one another or other legal obligations with which we must comply. Any failure or perceived failure by us or our employees, representatives, contractors, consultants, collaborators, or other third parties to comply with such requirements or adequately address privacy and cybersecurity concerns, even if unfounded, could result in additional cost and liability to us, damage our reputation, and materially adversely affect our business, results of operations, and financial condition.

Risks related to ownership of our common stock

The trading price of the shares of our common stock has been, and is likely to continue to be highly volatile, and purchasers of our common stock could incur substantial losses.

Our stock price has been, and is likely to continue to be, volatile. The stock market in general and the market for stock of biopharmaceutical companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, investors may not be able to sell their common stock at or above the price at which they paid. The market price for our common stock may be influenced by those factors discussed in this “Risk factors” section and many others, including:

- results of our clinical trials and preclinical studies, and the results of trials of our competitors or those of other companies in our market sector;
- our ability to enroll subjects in our future clinical trials;
- regulatory approval of our product candidates, or limitations to specific label indications or patient populations for its use, or changes or delays in the regulatory review process;
- regulatory or legal developments in the United States and other countries;
- changes in the structure of healthcare payment systems;
- the success or failure of our efforts to develop, acquire or license additional product candidates;
- innovations, clinical trial results, product approvals and other developments regarding our competitors;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures or capital commitments;

- manufacturing, supply or distribution delays or shortages;
- any changes to our relationship with any manufacturers, suppliers, collaborators or other strategic partners;
- achievement of expected product sales and profitability;
- variations in our financial results or those of companies that are perceived to be similar to us, or fluctuations in the valuation of such other companies;
- market conditions in the biopharmaceutical sector and issuance of securities analysts' reports or recommendations;
- trading volume of our common stock;
- an inability to obtain additional funding;
- sales of our stock by us, our insiders and our other stockholders;
- the impact of any natural disasters or public health emergencies;
- general economic, industry, geopolitical and market conditions other events or factors, many of which are beyond our control, such as the military conflict between Russia and Ukraine, inflation and interest rate changes and financial institution instability;
- additions or departures of key personnel;
- intellectual property, product liability or other litigation against us;
- actual or anticipated changes in estimates as to financial results, development timelines, or recommendations by securities analysts;
- expiration of market stand-off or lock-up agreements;
- changes in our capital structure, such as future issuances of securities and the incurrence of additional debt; and
- changes in accounting standards, policies, guidelines, interpretations or principles.

In addition, in the past, stockholders have initiated class action lawsuits against biopharmaceutical companies following periods of volatility in the market prices of these companies' stock. Such litigation, if instituted against us, could cause us to incur substantial costs and divert our management's attention and resources, which could have a material adverse effect on our business, financial condition and results of operations.

An active, liquid trading market for our common stock may not be maintained.

We can provide no assurance that we will be able to maintain an active trading market for our common stock. The lack of an active market may impair your ability to sell your shares at the time you wish to sell them or at a price that you consider reasonable. An inactive market may also impair our ability to raise capital by selling shares and may impair our ability to acquire other businesses or technologies using our shares as consideration, which, in turn, could materially adversely affect our business.

Our executive officers, directors and principal stockholders, if they choose to act together, will continue to have the ability to significantly influence all matters submitted to stockholders for approval.

As of December 31, 2023, our executive officers, directors and greater than 5% stockholders, in the aggregate, owned approximately 43% of our outstanding common stock. As a result, such persons, acting together, have the ability to significantly influence all matters submitted to our board of directors or stockholders for approval, including the appointment of our management, the election and removal of directors and approval of any significant transaction, as well as our management and business affairs. This concentration of ownership may have the effect of delaying, deferring or preventing a change in control, impeding a merger, consolidation, takeover or other business combination involving us, or discouraging a potential acquiror from making a tender offer or otherwise attempting to obtain control of our business, even if such a transaction would benefit other stockholders.

We do not currently intend to pay dividends on our common stock, and, consequently, your ability to achieve a return on your investment will depend on appreciation, if any, in the price of our common stock.

We have never declared or paid any cash dividend on our common stock. We currently anticipate that we will retain future earnings for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. In addition, any future debt agreements may preclude us from paying dividends. Any return to stockholders will therefore be limited to the appreciation of their stock. There is no guarantee that shares of our common stock will appreciate in value or even maintain the price at which stockholders have purchased their shares.

Sales of a substantial number of shares of our common stock by our existing stockholders in the public market could cause our stock price to fall.

Sales of a substantial number of shares of our common stock in the public market or the perception that these sales might occur could significantly reduce the market price of our common stock and impair our ability to raise adequate capital through the sale of additional equity securities.

The holders of 71,263,685 shares of our outstanding common stock, or approximately 47.2% of our total outstanding common stock as of December 31, 2023, are entitled to rights with respect to the registration of their shares under the Securities Act. Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act, except for shares held by affiliates, as defined in Rule 144 under the Securities Act. Any sales of securities by these stockholders, or the registration of such shares, could have a material adverse effect on the trading price of our common stock.

We are an emerging growth company and a smaller reporting company, and the reduced disclosure requirements applicable to emerging growth companies and smaller reporting companies may make our common stock less attractive to investors.

We are an emerging growth company, as defined in the Jumpstart Our Business Startups Act of 2012 (JOBS Act), and may remain an emerging growth company until the last day of the fiscal year following the fifth anniversary of the completion of our IPO. However, if certain events occur prior to the end of such five-year period, including if we become a large accelerated filer, as defined under the Exchange Act, our annual gross revenue exceed $1.235 billion or we issue more than $1.0 billion of non-convertible debt in any three-year period, we will cease to be an emerging growth company prior to the end of such five-year period. For so long as we remain an emerging growth company, we are permitted and intend to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include:

- being permitted to provide only two years of audited financial statements, in addition to any required unaudited interim financial statements, with correspondingly reduced “Management’s discussion and analysis of financial condition and results of operations” disclosure;
- not being required to comply with the auditor attestation requirements in the assessment of our internal control over financial reporting pursuant to the Sarbanes-Oxley Act of 2002 (Sarbanes-Oxley);
- not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor’s report providing additional information about the audit and the financial statements, unless the SEC determines the new rules are necessary for protecting the public;
- reduced disclosure obligations regarding executive compensation; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and shareholder approval of any golden parachute payments not previously approved.

We cannot predict whether investors will find our common stock less attractive if we rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be reduced or more volatile. In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of these accounting standards until they would otherwise apply to private companies. We have elected to avail ourselves of this exemption and, therefore, we will not be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

We are also a smaller reporting company as defined in the Exchange Act. We may continue to be a smaller reporting company even after we are no longer an emerging growth company. We may take advantage of certain of the scaled disclosures available to smaller reporting companies and will be able to take advantage of these scaled disclosures for so long as: (i) our voting and non-voting common stock held by non-affiliates is less than $250.0 million measured on the last business day of our second fiscal quarter, or (ii) our annual revenue is less than $100.0 million during the most recently completed fiscal year and the market value of our voting and non-voting common stock held by non-affiliates is less than $700.0 million measured on the last business day of our second fiscal quarter.

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 could significantly reduce the value of our shares to a potential acquiror or delay or prevent changes in control or changes in our management without the consent of our board of directors. The provisions in our charter documents include the following:

- 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;
- no cumulative voting in the election of directors, which limits the ability of minority stockholders to elect director candidates;
- the exclusive right of our board of directors, unless the board of directors grants such right to the stockholders, 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;
- the required approval of at least 66-2/3% of the shares entitled to vote to remove a director for cause, and the prohibition on removal of directors without cause;
- the ability of our board of directors to authorize the issuance of shares of 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 acquiror;
- the ability of our board of directors to alter our amended and restated bylaws without obtaining stockholder approval;
- the required approval of at least 66-2/3% of the shares entitled to vote to adopt, amend or repeal our amended and restated bylaws or repeal the provisions of our amended and restated certificate of incorporation regarding the election and removal of directors;
- a prohibition on stockholder action by written consent, which forces stockholder action to be taken at an annual or special meeting of our stockholders;
- an exclusive forum provision providing that the Court of Chancery of the State of Delaware will be the exclusive forum for certain actions and proceedings;
- the requirement that a special meeting of stockholders may be called only by 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
- 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 acquiror from conducting a solicitation of proxies to elect the acquiror'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.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware will be the exclusive forum for substantially all disputes between us and our stockholders and that the federal district courts shall be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees or the underwriters or any offering giving rise to such claim.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware is the exclusive forum for any derivative action or proceeding brought on our behalf, any action asserting a breach of fiduciary duty, any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, our amended and restated certificate of incorporation or our amended and restated bylaws, or any action asserting a claim against us that is governed by the internal affairs doctrine, provided that this provision would not apply to suits brought to enforce a duty or liability created by the Exchange Act. Furthermore, our amended and restated certificate of incorporation also provides that unless we consent in writing to the selection of an alternative forum, the federal district courts of the United States shall be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act, including all causes of action asserted against any defendant named in such complaint. For the avoidance of doubt, this provision is intended to benefit and may be enforced by us, our officers and directors, the underwriters to any offering giving rise to such complaint, and any other professional entity whose profession gives authority to a statement made by that person or entity and who has prepared or certified any part of the documents underlying the offering. These choice of forum provisions may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and other employees and result in increased costs for investors to bring a claim. By agreeing to this provision, however, stockholders will not be deemed to have waived our compliance with the federal securities laws and the rules and regulations thereunder. Furthermore, the enforceability of similar choice of forum provisions in other companies' certificates of incorporation has been challenged in legal proceedings, and it is possible that a court could find these types of provisions to be inapplicable or unenforceable. If a court were to find the choice of forum provisions in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could adversely affect our business and financial condition.

General risk factors

We incur significant costs as a result of operating as a public company, and our management is required to devote substantial time to new compliance initiatives.

As a public company, we incur significant legal, accounting and other expenses that we did not incur as a private company. We are subject to the reporting requirements of the Exchange Act, which require, among other things, that we file with the SEC annual, quarterly and current reports with respect to our business and financial condition. In addition, Sarbanes-Oxley, as well as rules subsequently adopted by the SEC and Nasdaq to implement provisions of Sarbanes-Oxley, impose significant requirements on public companies, including requiring establishment and maintenance of effective disclosure and financial controls and changes in corporate governance practices. Further, pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, the SEC has adopted additional rules and regulations in these areas, such as mandatory "say on pay" voting requirements and "pay versus performance" disclosure requirements that will apply to us when we cease to be an emerging growth company. Stockholder activism, the current political environment and the current high level of government intervention and regulatory reform may lead to substantial new regulations and disclosure obligations, which may lead to additional compliance costs and impact the manner in which we operate our business in ways we cannot currently anticipate.

The rules and regulations applicable to public companies have substantially increased our legal and financial compliance costs and have made some activities more time-consuming and costly. If these requirements divert the attention of our management and personnel from other business concerns, they could have a material adverse effect on our business, financial condition and results of operations. The increased costs will decrease our net income or increase our net loss, and may require us to reduce costs in other areas of our business or increase the prices of our products or services. We cannot predict or estimate the amount or timing of additional costs we may incur to respond to these requirements. The impact of these requirements could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, our board committees or as executive officers.

We are subject to US and certain foreign export and import controls, sanctions, embargoes, anti-corruption laws and anti-money laundering laws and regulations. We could face criminal liability and other serious consequences for violations, which could harm our business.

We are subject to export control and import laws and regulations, including the US Export Administration Regulations, US Customs regulations, and various economic and trade sanctions regulations administered by the US Treasury Department's Office of Foreign Assets Controls, and anti-corruption and anti-money laundering laws and regulations, including the US Foreign Corrupt Practices Act of 1977, as amended, the US domestic bribery statute contained in 18 U.S.C. § 201, the US Travel Act, the USA PATRIOT Act and other state and national anti-bribery and anti-money laundering laws in the countries in which we conduct activities. Anti-corruption laws are interpreted broadly and prohibit companies and their employees, agents, CROs, contractors and other collaborators and partners from authorizing, promising, offering, providing, soliciting or receiving, directly or indirectly, improper payments or anything else of value to or from recipients in the public or private sector. We may engage third parties for clinical trials outside of the United States, to sell our products abroad once we enter a commercialization phase, and/or to obtain necessary permits, licenses, patent registrations and other regulatory approvals. We have direct or indirect interactions with officials and employees of government agencies or government-affiliated hospitals, universities and other organizations. We can be held liable for the corrupt or other illegal activities of our employees, agents, CROs, contractors and other collaborators and partners, even if we do not explicitly authorize or have actual knowledge of such activities.

We are also subject to other US laws and regulations governing export controls, as well as economic sanctions and embargoes on certain countries and persons.

Any violations of the laws and regulations described above may result in substantial civil and criminal fines and penalties, imprisonment, the loss of export or import privileges, debarment, tax reassessments, breach of contract and fraud litigation, reputational harm and other consequences.

Furthermore, US export control laws and economic sanctions prohibit the provision of certain products and services to countries, governments, and persons targeted by US sanctions. US sanctions that have been or may be imposed as a result of military conflicts in other countries may impact our ability to continue activities at future clinical trial sites within regions covered by such sanctions. If we fail to comply with export and import regulations and such economic sanctions, penalties could be imposed, including fines and/or denial of certain export privileges. These export and import controls and economic sanctions could also adversely affect our supply chain.

We and any of our third-party manufacturers or suppliers may use potent chemical agents and hazardous materials, and any claims relating to improper handling, storage or disposal of these materials could be time-consuming or costly.

We and any of our third-party manufacturers or suppliers and current or potential future collaborators will use biological materials, potent chemical agents and may use hazardous materials, including chemicals and biological agents and compounds that could be dangerous to human health and safety of the environment. Our operations and the operations of our third-party manufacturers and suppliers also produce hazardous waste products. Federal, state and local laws and regulations govern the use, generation, manufacture, storage, handling and disposal of these materials and wastes. Compliance with applicable environmental laws and regulations may be expensive, and current or future environmental laws and regulations may impair our product development efforts. In addition, we cannot eliminate the risk of accidental injury or contamination from these materials or wastes. We do not carry specific biological or hazardous waste insurance coverage, and our property, casualty and general liability insurance policies specifically exclude coverage for damages and fines arising from biological or hazardous waste exposure or contamination. In the event of contamination or injury, we could be held liable for damages or be penalized with fines in an amount exceeding our resources, and our clinical trials or regulatory approvals could be suspended. Although we maintain workers' compensation insurance for certain costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials or other work-related injuries, this insurance may not provide adequate coverage against potential liabilities. We do not maintain insurance for toxic tort claims that may be asserted against us in connection with our storage or disposal of biologic, hazardous or radioactive materials.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations, which have tended to become more stringent over time. These current or future laws and regulations may impair our research, development or production efforts. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions or liabilities, which could materially adversely affect our business, financial condition, results of operations and prospects.

Business disruptions could seriously harm our future revenue and financial condition and increase our costs and expenses.

Our operations could be subject to earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, medical epidemics and other natural or manmade disasters or business interruptions, for which we are predominantly self-insured. We rely on third-party manufacturers to produce our product candidates. Our ability to obtain clinical supplies of our product candidates could be disrupted if the operations of these suppliers were affected by a man-made or natural disaster or other business interruption. In addition, our corporate headquarters is located in San Diego, California near major earthquake faults and fire zones, and the ultimate impact on us of being located near major earthquake faults and fire zones and being consolidated in a certain geographical area is unknown. The occurrence of any of these business disruptions could seriously harm our operations and financial condition and increase our costs and expenses.

Unstable market and economic conditions and adverse developments with respect to financial institutions and associated liquidity risk may have serious adverse consequences on our business, financial condition and stock price.

From time to time, the global credit and financial markets have experienced extreme volatility and disruptions, including severely diminished liquidity and credit availability, declines in consumer confidence, declines in economic growth, increases in unemployment rates and uncertainty about economic stability. The financial markets and the global economy may also be adversely affected by the current or anticipated impact of military conflict or wars, terrorism or other geopolitical events. Sanctions imposed by the United States and other countries in response to such conflicts may also adversely impact the financial markets and the global economy, and any economic countermeasures by the affected countries or others could exacerbate market and economic instability. Future adverse developments with respect to specific financial institutions or the broader financial services industry may lead to market-wide liquidity shortages, impair the ability of companies to access near-term working capital needs, and create additional market and economic uncertainty. There can be no assurance that future credit and financial market instability and a deterioration in confidence in economic conditions will not occur. Our general business strategy may be adversely affected by any economic downturn, liquidity shortages, volatile business environment or continued unpredictable and unstable market conditions. If the equity and credit markets deteriorate, or if adverse developments are experienced by financial institutions, it may cause short-term liquidity risk and also make any necessary debt or equity financing more difficult, more costly, more onerous with respect to financial and operating covenants and more dilutive. Failure to secure any necessary financing in a timely manner and on favorable terms could have a material adverse effect on our growth strategy, financial performance and stock price and could require us to delay or abandon clinical development plans. In addition, there is a risk that one or more of our current service providers, financial institutions, manufacturers and other partners may be adversely affected by the foregoing risks, which could directly affect our ability to attain our operating goals on schedule and on budget.

Changes in tax law may materially adversely affect our financial condition, results of operations and cash flows.

New income, sales, use or other tax laws, statutes, rules, regulations or ordinances could be enacted at any time, or interpreted, changed, modified or applied adversely to us, any of which could adversely affect our business operations and financial performance. The likelihood of these changes being enacted or implemented is unclear. We are currently unable to predict whether such changes will occur. If such changes are enacted or implemented, we are currently unable to predict the ultimate impact on our business. We urge our investors to consult with their legal and tax advisors with respect to any changes in tax law and the potential tax consequences of investing in our common stock.

If securities or industry analysts do not publish research or reports or publish unfavorable research or reports 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, our business, our market or our competitors. If one or more of the analysts who covers us downgrades our stock, our stock price would likely decline. If one or more of these analysts ceases to cover us or fails to regularly publish reports on us, interest in our stock could decrease, which could cause our stock price or trading volume to decline.

If we fail to maintain proper and effective internal control over financial reporting, our ability to produce accurate and timely financial statements could be impaired, investors may lose confidence in our financial reporting and the trading price of our common stock may decline.

Pursuant to Section 404 of Sarbanes-Oxley, our management is required to report upon the effectiveness of our internal control over financial reporting. When we lose our status as an "emerging growth company" and reach an accelerated filer threshold, our independent registered public accounting firm will be required to attest to the effectiveness of our internal control over financial reporting. The rules governing the standards that must be met for our management to assess our internal control over financial reporting are complex and require significant documentation, testing and possible remediation. To comply with the requirements of being a reporting company under the Exchange Act, we may need to upgrade our information technology systems; implement additional financial and management controls, reporting systems and procedures; and hire additional accounting and finance staff. If we or, if required, our auditors are unable to conclude that our internal control over financial reporting is effective, investors may lose confidence in our financial reporting and the trading price of our common stock may decline.

We cannot assure you that there will not be material weaknesses or significant deficiencies in our internal control over financial reporting in the future. Any failure to maintain internal control over financial reporting could severely inhibit our ability to accurately report our financial condition, results of operations or cash flows. If we are unable to conclude that our internal control over financial reporting is effective, or if our independent registered public accounting firm determines we have a material weakness or significant deficiency in our internal control over financial reporting once that firm begins its Section 404 audits, investors may lose confidence in the accuracy and completeness of our financial reports, the market price of our common stock could decline, and we could be subject to sanctions or investigations by Nasdaq, the SEC or other regulatory authorities. Failure to remedy any material weakness in our internal control over financial reporting, or to implement or maintain other effective control systems required of public companies, could also restrict our future access to the capital markets.

Our disclosure controls and procedures may not prevent or detect all errors or acts of fraud.

We are subject to the periodic reporting requirements of the Exchange Act. We designed our disclosure controls and procedures to reasonably assure that information we must disclose in reports we file or submit under the Exchange Act is accumulated and communicated to management, and recorded, processed, summarized and reported within the time periods specified in the rules and forms of the SEC. We believe that any disclosure controls and procedures or internal controls and procedures, no matter how well-conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met.

These inherent limitations include the facts that judgments in decision-making can be faulty and that breakdowns can occur because of simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people or by an unauthorized override of the controls. Accordingly, because of the inherent limitations in our control system, misstatements due to error or fraud may occur and not be detected.

We could be subject to securities class action litigation.

In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities. This risk is especially relevant for us because biotechnology and biopharmaceutical companies have experienced significant stock price volatility in recent years. If we face such litigation, it could result in substantial costs and a diversion of our management's attention and resources, which could harm our business.

Item 1B. Unresolved Staff Comments.

None.

Item 1C. Cybersecurity.

Cybersecurity Risk Management and Strategy

We have developed and implemented a cybersecurity risk management program intended to protect the confidentiality, integrity, and availability of our critical systems and information.

Our program is developed and informed by industry best practices such as the National Institute of Standards and Technology Cybersecurity Framework (NIST CSF) and input from expert third-party consultants. It's important to note that our adoption of the NIST CSF serves as a blueprint to aid in the identification, assessment, and mitigation of cybersecurity risks pertinent to our operations, rather than as a certification of compliance with specific technical standards or requirements.

Our cybersecurity risk management program is integrated into our overall enterprise risk management program, and shares common methodologies, reporting channels and governance processes that apply across the enterprise risk management program to other legal, compliance, strategic, operational, and financial risk areas.

Our cybersecurity risk management program includes:

- risk assessments designed to help identify material cybersecurity risks to our critical systems, information, and our broader enterprise IT environment; an IT security team (including Chief Operating Officer (COO)) principally responsible for managing (1) our cybersecurity risk assessment processes, (2) our security controls, and (3) our response to cybersecurity incidents;
- the use of external service providers, where appropriate, to assess, test or otherwise assist with aspects of our security controls;
- cybersecurity awareness training of our employees, incident response personnel, and senior management; and
- a cybersecurity incident response plan that includes procedures for responding to cybersecurity incidents.

In the near-term our cybersecurity risk management program will include a third-party risk management process for service providers, suppliers, and vendors.

We have not identified risks from known cybersecurity threats, including as a result of any prior cybersecurity incidents, that have materially affected or are reasonably likely to materially affect us, including our operations, business strategy, results of operations, or financial condition.

Cybersecurity Governance

Our Board considers cybersecurity risk as part of its risk oversight function and has delegated to the Audit Committee oversight of cybersecurity and other information technology risks. The Audit Committee oversees management's implementation of our cybersecurity risk management program.

The Audit Committee receives reports from management on our cybersecurity risks no less than twice per calendar year. In addition, management updates the Audit Committee, as necessary, regarding any material cybersecurity incidents, as well as any incidents with lesser impact potential.

The Audit Committee reports to the full Board regarding its activities, including those related to cybersecurity. The full Board also receives briefings from management on our cyber risk management program. Board members receive presentations on cybersecurity topics from our Chief Operating Officer as part of the Board's continuing education on topics that impact public companies.

Our management team, including our Chief Operating Officer, is responsible for assessing and managing our material risks from cybersecurity threats. The team has primary responsibility for our overall cybersecurity risk management program and supervises both our internal cybersecurity personnel and our retained external cybersecurity consultants. Collectively, the IT security team that is responsible for managing our cybersecurity risks has over 50 years of experience in mitigating cybersecurity risks.

Our management team supervises efforts to prevent, detect, mitigate, and remediate cybersecurity risks and incidents through various means, which may include briefings from internal IT personnel; threat intelligence and other information obtained from governmental, public or private sources, including external consultants engaged by us; and alerts and reports produced by cybersecurity tools deployed in the IT environment.

Item 2. Properties.

Our corporate headquarters is located in San Diego, California, where we lease 77,828 square feet of office and laboratory space pursuant to a lease that expires in April 2032 and may be terminated early under certain circumstances. In January 2024, we entered into an agreement to sublease 10,000 square feet of such office space with a sublease term of three years, which includes an option for the subtenant to renew for an additional year and an early termination clause.

We also lease 29,542 square feet of office and laboratory space in South San Francisco, California, pursuant to a lease that expires in October 2032, with an option to extend the term by 5 years, subject to certain conditions.

We believe our existing facilities are adequate to meet our current business requirements for the near term, and that additional space will be available on commercially reasonable terms, if required.

Item 3. Legal Proceedings.

We are not currently a party to any material proceedings. From time to time, we may become involved in legal proceedings or be subject to claims arising in the ordinary course of our business. Regardless of outcome, such proceedings or claims can have an adverse impact on us because of defense and settlement costs, diversion of resources and other factors, and there can be no assurances that favorable outcomes will be obtained.

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

Our common stock trades under the symbol "ERAS" on the Nasdaq Global Select Market.

Holders of Our Common Stock

As of February 29, 2024, there were approximately 55 holders of record of our common stock. This number was derived from our shareholder records and does not include beneficial owners of our common stock whose shares are held in the name of various dealers, clearing agencies, banks, brokers and other fiduciaries.

Dividend Policy

We have never declared or paid any cash dividends on our capital stock. We intend to retain all available funds and future earnings, if any, to finance the operation of our business and do not anticipate paying any cash dividends in the foreseeable future. Any future determination related to dividend policy will be made at the discretion of our board of directors after considering our financial condition, results of operations, capital requirements, business prospects and other factors the board of directors deems relevant, and subject to the restrictions contained in any future financing instruments.

Securities Authorized for Issuance Under Equity Compensation Plans

Information about our equity compensation plans will be included in our definitive proxy statement to be filed with the SEC with respect to our 2024 Annual Meeting of Stockholders and is incorporated herein by reference.

Unregistered Sales of Equity Securities

None.

Use of Proceeds

On July 15, 2021, the SEC declared effective our registration statement on Form S-1 (File No. 333-257436), as amended, filed in connection with our IPO. Our IPO closed on July 20, 2021, and we issued and sold 21,562,500 shares of our common stock at a price to the public of $16.00 per share, which included the exercise in full of the underwriters' option to purchase additional shares. We received gross proceeds from our IPO of $345.0 million, before deducting underwriting discounts and commissions of $24.2 million and offering costs of $3.8 million. The managing underwriters of the offering were J.P. Morgan Securities LLC, Morgan Stanley & Co. LLC, BofA Securities, Inc., Evercore Group L.L.C. and Guggenheim Securities, LLC. No offering costs were paid or are payable, directly or indirectly, to our directors or officers, to persons owning 10% or more of any class of our equity securities or to any of our affiliates.

As of December 31, 2023, we have used approximately $295.4 million of the proceeds from our IPO for general corporate purposes, including to fund the research and development of ERAS-007, ERAS-601 and our other RAS/MAPK pathway-focused pipeline programs. There has been no material change in the planned use of such proceeds from that described in the prospectus for our IPO.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

None.

Item 6. Reserved

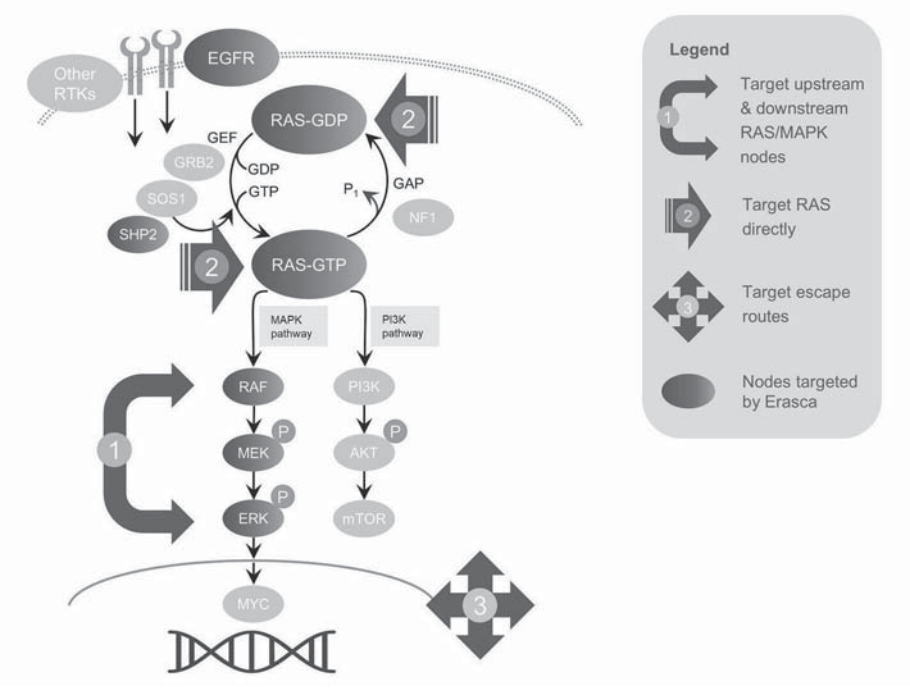
Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our consolidated financial statements and notes thereto included elsewhere in this Annual Report on Form 10-K. This discussion contains forward-looking statements that involve risks and uncertainties, including those described in the section titled "Special Note Regarding Forward Looking Statements." As a result of many factors, including those factors set forth in the "Risk Factors" section of this Annual Report on Form 10-K, our actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Overview

We are a clinical-stage precision oncology company singularly focused on discovering, developing, and commercializing therapies for patients with RAS/MAPK pathway-driven cancers. Molecular alterations in RAS, the most frequently mutated oncogene, and the MAPK pathway, one of the most frequently altered signaling pathways in cancer, account for approximately 5.4 million new patients diagnosed with cancer globally each year. Our company was co-founded by leading pioneers in precision oncology and RAS targeting to create novel therapies and combination regimens designed to comprehensively shut down the RAS/MAPK pathway for the treatment of cancer. We have assembled one of the deepest, wholly-owned or controlled RAS/MAPK pathway-focused pipelines in the industry, which is focused on modality-agnostic programs aligned with our three therapeutic strategies of: (1) targeting key upstream and downstream signaling nodes in the RAS/MAPK pathway; (2) targeting RAS directly; and (3) targeting escape routes that emerge in response to treatment.

The following figure shows the RAS/MAPK pathway and how the three therapeutic strategies listed above attempt to comprehensively and synergistically shut down the RAS/MAPK pathway.



The target breadth and molecular diversity represented in our pipeline enable us to pursue a systematic, data-driven, portfolio-wide clinical development effort to identify single agent and combination approaches with the goal of prolonging survival in numerous patient populations with high unmet medical needs. Our modality-agnostic approach aims to allow us to selectively and potently target critical signaling nodes with the most appropriate modality, including small molecule therapeutics and large molecule therapeutics. Our purpose-built pipeline includes three clinical-stage programs (a pan-RAF inhibitor, an ERK inhibitor, and a central nervous system (CNS)-penetrant EGFR inhibitor), and additional discovery-stage programs targeting other key oncogenic drivers. We believe our world-class team's capabilities and experience, further guided by our scientific advisory board, which includes the world's leading experts in the RAS/MAPK pathway, uniquely position us to achieve our bold mission of erasing cancer.

Our lead product candidate is naporafenib, for which we plan to initiate a pivotal Phase 3 trial in the first half of 2024 for patients with NRAS-mutated (NRASm) melanoma. We dosed the first patient in a Phase 1b trial in August 2023 for patients with RAS Q61X solid tumors to inform additional clinical development pathways for naporafenib. Naporafenib is a pan-RAF inhibitor with first-in-class and best-in-class potential for patients with NRASm melanoma, RAS Q61X solid tumors, and other RAS/MAPK pathway-driven tumors. RAF proteins are ubiquitously expressed serine-threonine kinases that constitute a key node of the RAS/MAPK pathway downstream of RAS and upstream of MEK. The RAF protein family consists of ARAF, BRAF, and CRAF (RAF1) that are activated through dimerization. Mutations in RAF proteins have been observed in many cancers, such as melanoma, colorectal cancer (CRC), non-small cell lung cancer (NSCLC), and thyroid cancer. We in-licensed naporafenib from Novartis Pharma AG (Novartis) in December 2022. Naporafenib has been dosed in over 500 patients to date, whereby safety, tolerability, pharmacokinetics (PK), and pharmacodynamics have been established in both monotherapy and select combinations, with clinical proof-of-concept (PoC) data in combination with trametinib (MEKINIST) for patients with NRASm melanoma, which includes NRAS Q61X melanoma, and preliminary clinical PoC data in combination with trametinib for patients with RAS Q61X NSCLC. In December 2023, we announced that the US Food and Drug Administration (FDA) granted Fast Track Designation (FTD) to naporafenib in combination with trametinib for the treatment of adult patients with unresectable or metastatic melanoma who have progressed on, or are intolerant to, an anti-programmed death-1 (ligand 1) (PD-(L)1)-based regimen, and whose tumors contain an NRAS mutation (NRASm). Programs that receive FTD may benefit from early and frequent interactions with the FDA during the clinical development process and, if relevant criteria are met, the FDA may consider reviewing portions of a marketing application before the sponsor submits the complete application.

We are pursuing a broad development strategy for naporafenib, which includes our SEACRAFT trials designed to evaluate naporafenib's development opportunities in combination with other targeted therapies. We are prioritizing rapid development for naporafenib plus trametinib in the Phase 1b SEACRAFT-1 trial for patients with RAS Q61X solid tumors, which dosed its first patient in August 2023, and in the planned Phase 3 SEACRAFT-2 trial for patients with NRASm melanoma. SEACRAFT-1 is supported by clinical PoC data in patients with NRAS Q61X melanoma and preliminary clinical PoC data in patients with KRAS Q61X NSCLC. SEACRAFT-2 is supported by clinical PoC data in patients with NRASm melanoma, as presented by Novartis at the European Society for Medical Oncology Congress 2022 medical conference and as published in March 2023 by de Braud et al. in the *Journal of Clinical Oncology*. In connection with our SEACRAFT-1 and -2 trials, we have announced clinical trial collaboration and supply agreements (CTCSAs) with Novartis for its MEK inhibitor, trametinib (MEKINIST). We are sponsoring and funding the clinical trials and Novartis is providing its drug to us free of charge.

Our next most-advanced product candidate is ERAS-007 (our oral ERK1/2 inhibitor), which targets the most distal node of the RAS/MAPK pathway. We have developed a clinical development plan that has included multiple tumor types for ERAS-007, which we refer to as our HERKULES series of clinical trials. In September 2021, we dosed the first patient in HERKULES-3, a Phase 1b/2 master protocol clinical trial for ERAS-007 in combination with various agents in patients with gastrointestinal (GI) cancers. In connection with our HERKULES-3 trial, we have announced CTCSAs with Pfizer Inc. for its BRAF inhibitor, encorafenib (BRAFTOVI), Eli Lilly and Company (Lilly) for its EGFR antibody, cetuximab (ERBITUX), and Pierre Fabre for its BRAF inhibitor, encorafenib (BRAFTOVI), in key international territories. In all these cases, we are sponsoring and funding the clinical trial and the partner is providing its drug to us free of charge.

The master protocol for the HERKULES-3 Phase 1b/2 clinical trial provides the flexibility to explore additional combinations and expand into other GI cancer indications. In May 2023, we announced encouraging preliminary data for the ERAS-007 combination with encorafenib and cetuximab (EC) in patients with EC-naïve BRAFm CRC in a poster presentation that we presented at the American Society of Clinical Oncology Annual Meeting in June 2023.

In June 2023, we provided updates with respect to our HERKULES-1 trial (for patients with solid tumors caused by RAS/MAPK pathway alterations), HERKULES-2 trial (for patients with EGFR-mutated or KRAS-mutated NSCLC), and one of the sub-studies of our HERKULES-3 trial (for patients with KRAS- or NRAS-mutant CRC and KRAS-mutant PDAC). These updates consisted of the following:

- **HERKULES-1: ERAS-007 plus ERAS-601 in patients with advanced solid tumors:** We have deprioritized evaluation of this combination as dose escalation safety data do not support continued evaluation of the regimen tested

- **HERKULES-2: ERAS-007 plus osimertinib in patients with post-osimertinib EGFR-mutant NSCLC:** We have deprioritized evaluation of this combination in this indication as clinical efficacy data do not support continued evaluation

- **HERKULES-3 sub-study that consisted of ERAS-007 plus palbociclib in patients with KRAS- or NRAS-mutant CRC and KRAS-mutant PDAC:** We have deprioritized evaluation of this combination in this indication as clinical efficacy data do not support continued evaluation

As a result of these deprioritizations, we are no longer enrolling patients in the HERKULES-1 trial, the HERKULES-2 trial, or the HERKULES-3 sub-study that consisted of ERAS-007 plus palbociclib described above.

With respect to the HERKULES-3 Phase 1b trial for ERAS-007 plus EC in EC-naïve BRAFm CRC patients, we anticipate a Phase 1b dose expansion data readout in the first half of 2024.

Our third clinical program is ERAS-801, an investigational CNS-penetrant EGFR inhibitor. In February 2022, we dosed the first patient in our THUNDERBBOLT-1 Phase 1 clinical trial for ERAS-801 in patients with recurrent glioblastoma (GBM). In May 2023, we announced that the FDA granted FTD to ERAS-801 for the treatment of adult patients with GBM with EGFR gene alterations. In June 2023, we announced that the FDA granted Orphan Drug Designation (ODD) to ERAS-801 for the treatment of patients with malignant glioma, which includes GBM. Provided that the product candidate is approved by the FDA for the orphan-designated disease or condition, ODD entitles a party to the potential for seven years of post-approval marketing exclusivity, subject to certain exemptions, and financial incentives such as tax advantages and user fee waivers. In November 2023, we announced that a maximum tolerated dose (MTD) was identified for ERAS-801. We anticipate presenting Phase 1 monotherapy data from THUNDERBBOLT-1 in 2024.

In June 2023, we announced that we deprioritized ERAS-3490, our CNS-penetrant KRAS G12C inhibitor, due to the increasingly competitive landscape for small- and mid-cap biopharma companies in the KRAS G12C inhibitor market, despite the program's potential for differentiation in this market.

In November 2023, we announced that we deprioritized the FLAGSHP-1 Phase 1b combination trial of ERAS-601 SHP2 inhibitor with cetuximab (ERBITUX). Though ERAS-601 achieved confirmed responses as a monotherapy and in combination with cetuximab, preliminary data did not justify further development of this combination in the FLAGSHP-1 indications.

We are also advancing additional programs targeting key oncogenic drivers in the RAS/MAPK pathway, which we will need to successfully progress through discovery and investigational new drug application (IND)-enabling activities prior to advancing these programs into clinical development, if at all.

We do not own or operate, and currently have no plans to establish, any manufacturing facilities. We rely, and expect to continue to rely, on third parties for the manufacture of our product candidates for preclinical and clinical testing, as well as for commercial manufacture if any of our product candidates obtain marketing approval. We are working with our current manufacturers to ensure that we will be able to scale up our manufacturing capabilities to support our clinical plans. We are also in the process of locating and qualifying additional manufacturers to build redundancies into our supply chain. In addition, we rely on third parties to package, label, store, and distribute our product candidates, and we intend to continue to rely on third parties with respect to our commercial products if marketing approval is obtained. We believe that this strategy allows us to maintain a more efficient infrastructure by eliminating the need for us to invest in our own manufacturing facilities, equipment, and personnel while also enabling us to focus our expertise and resources on the design and development of our product candidates.

In July 2021, we completed our IPO and issued 21,562,500 shares of our common stock, including the exercise in full by the underwriters of their option to purchase 2,812,500 shares of our common stock, at a price to the public of $16.00 per share. Our aggregate net proceeds from the offering were $317.0 million, net of underwriting discounts and commissions of $24.2 million and offering costs of $3.8 million.

In August 2022, we entered into an Open Market Sale Agreement (the Sale Agreement) with Jefferies LLC (the Agent), pursuant to which we may offer and sell shares of our common stock having an aggregate offering price of up to $200 million from time to time, in “at the market” offerings through the Agent. Sales of the shares of common stock, if any, will be made at prevailing market prices at the time of sale, or as otherwise agreed with the Agent. The Agent will receive a commission from us of up to 3.0% of the gross proceeds of any shares of common stock sold under the Sale Agreement. There have been no shares of our common stock sold under the Sale Agreement as of December 31, 2023.

In December 2022, we completed an underwritten offering (2022 Offering) and issued 15,384,616 shares of our common stock at a price to the public of $6.50 per share. Proceeds from the 2022 Offering were $94.9 million, net of underwriting discounts and commissions and offering costs of $5.1 million.

Since our inception in 2018, we have devoted substantially all of our resources to organizing and staffing our company, business planning, raising capital, identifying, acquiring, and in-licensing our product candidates, establishing our intellectual property portfolio, conducting research, preclinical studies and clinical trials, establishing arrangements with third parties for the manufacture of our product candidates and related raw materials, and providing general and administrative support for these operations. We do not have any products approved for sale and have not generated any revenue. As of December 31, 2023, we have raised a total of $765.4 million to fund our operations, comprised primarily of gross proceeds from our IPO and 2022 Offering and the sale and issuance of convertible preferred stock. As of December 31, 2023, we had cash, cash equivalents and marketable securities of $322.0 million.

We have incurred significant operating losses since inception. Our net losses were $125.0 million and $242.8 million for the years ended December 31, 2023 and 2022, respectively. As of December 31, 2023, we had an accumulated deficit of $606.0 million. We expect our expenses and operating losses will increase substantially for the foreseeable future, particularly if and as we conduct our ongoing and planned clinical trials and preclinical studies; continue our research and development activities; utilize third parties to manufacture our product candidates and related raw materials; hire additional personnel; acquire, in-license, or develop additional product candidates; expand and protect our intellectual property; and incur additional costs associated with being a public company. If we obtain regulatory approval for any of our product candidates, we expect to incur significant commercialization expenses related to product sales, marketing, manufacturing, and distribution. In addition, as our product candidates progress through development and toward commercialization, we will need to make milestone payments to the licensors and other third parties from whom we have in-licensed or acquired our product candidates. Our net losses may fluctuate significantly from quarter-to-quarter and year-to-year, depending on the timing of our clinical trials and preclinical studies and our expenditures on other research and development activities.

Based upon our current operating plans, we believe that our cash, cash equivalents and marketable securities as of December 31, 2023 will be sufficient to fund our operations into the first half of 2026. We do not expect to generate any revenues from product sales until we successfully complete development and obtain regulatory approval for one or more of our product candidates, which we expect will take a number of years and may never occur. Accordingly, until such time as we can generate significant revenue from sales of our product candidates, if ever, we expect to finance our cash needs through equity offerings, debt financings or other capital sources, including potential collaborations, licenses, and other similar arrangements. However, we may be unable to raise additional funds or enter into such other arrangements when needed on favorable terms or at all. Our failure to raise capital or enter into such other arrangements when needed would have a negative impact on our financial condition and could force us to delay, limit, reduce, or terminate our research and development programs or other operations, or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Our financial condition and results of operations may also be impacted by other factors we may not be able to control, such as geopolitical and economic events. We do not believe that such factors had a material adverse impact on our results of operations during the year ended December 31, 2023.

Our acquisition and license agreements

We have entered into in-license and acquisition agreements pursuant to which we in-licensed or acquired certain intellectual property rights related to our product candidates and development programs.

For additional information regarding these agreements, see the section titled “Business—Our acquisition and license agreements” in this Annual Report on Form 10-K.

Components of results of operations

Revenue

We do not expect to generate any revenue from the sale of products unless and until such time that our product candidates have advanced through clinical development and obtained regulatory approval, if ever. If we fail to complete preclinical and clinical development of product candidates or obtain regulatory approval for them, our ability to generate future revenues, and our results of operations and financial position would be adversely affected.

Operating expenses

Research and development

Research and development expenses consist of external and internal costs associated with our research and development activities, including our discovery and research efforts and the preclinical and clinical development of our product candidates. Research and development costs are expensed as incurred. Our research and development expenses include:

- external costs, including expenses incurred under arrangements with third parties, such as contract research organizations (CROs), contract manufacturing organizations (CMOs), consultants and our scientific advisors; and
- internal costs, including:
  - employee-related expenses, including salaries, benefits, and stock-based compensation for those individuals involved in research and development efforts;
  - the costs of laboratory supplies and acquiring, developing and manufacturing preclinical study materials; and
  - facilities and depreciation, which include direct and allocated expenses for rent of facilities and depreciation.

The following table summarizes our research and development expenses incurred for the following periods (in thousands):

	Year Ended December 31,	
	2023	2022
Naporafenib[1]	$ 31,564	$ 142
ERAS-007	19,943	36,025
Other clinical programs	24,949	39,242
Other discovery and preclinical programs	27,365	37,048
Total research and development expenses	$ 103,821	$ 112,457

(1) We in-licensed naporafenib in December 2022.

We expect our research and development expenses to increase substantially for the foreseeable future as we continue to conduct our ongoing research and development activities, conduct clinical trials and advance our preclinical research programs toward clinical development, particularly as more of our product candidates move into later stages of development, which typically cost more. The process of conducting clinical trials and preclinical studies necessary to obtain regulatory approval is costly and time-consuming. We may never succeed in achieving marketing approval for any of our product candidates.

The timelines and costs with research and development activities are uncertain, can vary significantly for each product candidate and program and are difficult to predict. We anticipate we will make determinations as to which product candidates and programs to pursue and how much funding to direct to each product candidate and program on an ongoing basis in response to preclinical and clinical results, regulatory developments, ongoing assessments as to each product candidate's and program's commercial potential, and our ability to enter into collaborations, licenses or other similar agreements to the extent we determine the resources or expertise of a third-party would be beneficial for a given product candidate or program. We will need to raise substantial additional capital in the future. In addition, we cannot forecast which product candidates and programs may be subject to future collaborations, licenses, or other agreements, when such arrangements will be secured, if at all, and to what degree such arrangements would affect our development plans and capital requirements.

Our development costs may vary significantly based on factors such as:

- the number and scope of preclinical and IND-enabling studies and clinical trials;
- per patient trial costs;
- the number of trials required for approval;
- the number of sites included in the trials;
- the countries in which the trials are conducted;
- the length of time required to enroll eligible patients;
- the number of patients that participate in the trials;
- the number of doses that patients receive;
- the drop-out or discontinuation rates of patients;
- potential additional safety monitoring requested by regulatory agencies;
- the duration of patient participation in the trials and follow-up;
- the cost and timing of manufacturing our product candidates;
- the phase of development of our product candidates;
- the efficacy and safety profile of our product candidates;
- the timing, receipt and terms of any approvals from applicable regulatory authorities;
- maintaining a continued acceptable safety profile of our products following approval, if any;
- significant and changing government regulation and regulatory guidance;
- the impact of any interruptions to our operations or to those of third parties with whom we work due to geopolitical and economic events; and
- the extent to which we establish additional collaboration, license or other arrangements.

In-process research and development

In-process research and development expenses include rights acquired as part of asset acquisitions or in-licenses to develop and commercialize product candidates. Upfront payments that relate to the acquisition of a new product candidate, as well as pre-commercial milestone payments, are immediately expensed as in-process research and development in the period in which they are incurred, provided that the new product candidate did not also include processes or activities that would constitute a “business” as defined under US generally accepted accounting principles (US GAAP), the product candidate has not achieved regulatory approval for marketing and, absent obtaining such approval, has no established alternative future use.

In-process research and development expenses consist primarily of our upfront payments, milestone payments, and our stock issuances in connection with our acquisition and in-license agreements.

General and administrative

General and administrative expenses consist primarily of employee-related expenses, including salaries, benefits and stock-based compensation, for employees in our finance, accounting, legal, information technology, business development and support functions. Other general and administrative expenses include allocated facility and depreciation related costs not otherwise included in research and development expenses and professional fees for auditing, tax, intellectual property and legal services. Costs related to filing and pursuing patent applications are recognized as general and administrative expenses as incurred since recoverability of such expenditures is uncertain.

We expect our general and administrative expenses will increase substantially for the foreseeable future as we continue to increase our general and administrative headcount to support our continued research and development activities and, if any product candidates receive marketing approval, commercialization activities, as well as to support our operations generally.

Other income (expense), net

Interest income

Interest income consists primarily of interest earned on our cash, cash equivalents and marketable securities.

Results of operations

Comparison of the years ended December 31, 2023 and 2022

The following table summarizes our results of operations for the years ended December 31, 2023 and 2022 (in thousands):

	Year Ended December 31,		
	2023	2022	Change
Operating expenses:			
Research and development	$ 103,821	$ 112,457	$ (8,636)
In-process research and development	—	102,000	(102,000)
General and administrative	37,704	32,993	4,711
Total operating expenses	141,525	247,450	(105,925)
Loss from operations	(141,525)	(247,450)	105,925
Total other income (expense), net	16,483	4,645	11,838
Net loss	$ (125,042)	$ (242,805)	$ 117,763

Research and development expenses

Research and development expenses were $103.8 million for the year ended December 31, 2023 compared to $112.5 million for the year ended December 31, 2022. The decrease of $8.6 million was primarily driven by decreases of $14.1 million in expenses incurred in connection with clinical trials, preclinical studies and discovery activities and $4.8 million in outsourced services and consulting fees, resulting primarily from our pipeline prioritization decisions, partially offset by a $4.5 million increase in facilities-related expenses and depreciation primarily due to our new San Diego and South San Francisco facilities which we moved into in the second and third quarters of 2022, respectively, a $3.3 million increase in personnel costs due to an increase in the average headcount and the employee retention credit of $1.5 million recorded during the year ended December 31, 2022, and a $2.4 million increase in stock-based compensation expense.

In-process research and development expenses

In-process research and development expenses were $0 for the year ended December 31, 2023 compared to $102.0 million for the year ended December 31, 2022. In-process research and development expenses for the year ended December 31, 2022 related to a $20.0 million upfront payment and issuance of 12,307,692 shares of our common stock to Novartis at a price of $6.50 per share or a total fair value of equity of $80.0 million in connection with the license agreement we entered into in December 2022 with Novartis, and a development milestone payment of $2.0 million in connection with our license agreement with Katmai Pharmaceuticals, Inc.

General and administrative expenses

General and administrative expenses were $37.7 million for the year ended December 31, 2023 compared to $33.0 million for the year ended December 31, 2022. The increase of $4.7 million was primarily driven by increases of $3.8 million in stock-based compensation expense, $1.8 million in personnel costs due to an increase in the average headcount and the employee retention credit of $0.7 million recorded during the year ended December 31, 2022, and $0.6 million in facilities and office-related expenses, partially offset by decreases of $1.0 million in insurance costs and $0.8 million in legal fees.

Other income (expense), net

Other income (expense), net was $16.5 million for the year ended December 31, 2023 compared to $4.6 million for the year ended December 31, 2022. The increase of $11.8 million was primarily related to an increase in interest earned on our cash, cash equivalents and marketable securities.

Liquidity and capital resources

Sources of liquidity

In July 2021, we completed our IPO and issued 21,562,500 shares of our common stock, including the exercise in full by the underwriters of their option to purchase 2,812,500 shares of our common stock, at a price to the public of $16.00 per share. Our aggregate net proceeds from the offering were $317.0 million, net of underwriting discounts and commissions of $24.2 million and offering costs of $3.8 million. Prior to the IPO, we received aggregate gross proceeds of $320.4 million from the sale of shares of our convertible preferred stock.

In August 2022, we entered into the Sale Agreement with the Agent, pursuant to which we may offer and sell shares of our common stock having an aggregate offering price of up to $200 million from time to time, in “at the market” offerings through the Agent. Sales of the shares of common stock, if any, will be made at prevailing market prices at the time of sale, or as otherwise agreed with the Agent. The Agent will receive a commission from us of up to 3.0% of the gross proceeds of any shares of common stock sold under the Sale Agreement. There have been no shares of our common stock sold under the Sale Agreement as of December 31, 2023.

In December 2022, we completed the 2022 Offering and issued 15,384,616 shares of our common stock at a price to the public of $6.50 per share. Proceeds from the 2022 Offering were $94.9 million, net of underwriting discounts and commissions and offering costs of $5.1 million.

Future capital requirements

As of December 31, 2023, we had cash, cash equivalents and marketable securities of $322.0 million. Based upon our current operating plans, we believe that our cash, cash equivalents and marketable securities, will be sufficient to fund our operations into the first half of 2026. However, our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement that involves risks and uncertainties, and actual results could vary materially. We have based this estimate on assumptions that may prove to be wrong, and we could deplete our capital resources sooner than we expect. Additionally, the process of conducting preclinical studies and testing product candidates in clinical trials is costly, and the timing of progress and expenses in these studies and trials is uncertain.

Our future capital requirements are difficult to forecast and will depend on many factors, including but not limited to:

- the type, number, scope, progress, expansions, results, costs and timing of discovery, preclinical studies and clinical trials of our product candidates that we are pursuing or may choose to pursue in the future, including the costs of any third-party products used in our combination clinical trials that are not covered by such third party or other sources;
- the costs and timing of manufacturing for our product candidates with CMOs, including commercial manufacturing, if any product candidate is approved;
- the costs, timing and outcome of regulatory review of our product candidates;
- the costs of obtaining, maintaining and enforcing our patents and other intellectual property rights;
- our efforts to enhance operational systems and hire additional personnel to satisfy our obligations as a public company, including enhanced internal controls over financial reporting;
- the costs associated with hiring additional personnel, consultants, and CROs as our preclinical and clinical activities increase;
- the timing and amount of the milestone or other payments we must make to the licensors and other third parties from whom we have in-licensed or acquired our product candidates or technologies;

- the costs and timing of establishing or securing sales and marketing capabilities if any product candidate is approved;
- our ability to achieve sufficient market acceptance, coverage and adequate reimbursement from third-party payors and adequate market share and revenue for any approved products;
- patients' willingness to pay out-of-pocket for any approved products in the absence of coverage and/or adequate reimbursement from third-party payors;
- the terms and timing of establishing and maintaining collaborations, licenses and other similar arrangements;
- any delays and cost increases that result from geopolitical and economic events; and
- costs associated with any products or technologies that we may in-license or acquire.

We have no other committed sources of capital. Until we can generate a sufficient amount of product revenue to finance our cash requirements, if ever, we expect to finance our future cash needs primarily through equity offerings (including through the Sale Agreement), debt financings or other capital sources, including potential collaborations, licenses and other similar arrangements. However, we may be unable to raise additional funds or enter into such other arrangements when needed on favorable terms or at all. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interest of our stockholders will be or could be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of our common stockholders. Debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. If we raise additional funds through collaborations, licensing, or other similar arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings when needed, we may be required to delay, limit, reduce or terminate our research and development programs or other operations, or grant rights to develop and market product candidates to third parties that we would otherwise prefer to develop and market ourselves.

Cash flows

The following table shows a summary of our cash flows for the periods presented (in thousands):

	Year Ended December 31,	
	2023	2022
Net cash (used in) provided by:		
Operating activities	$ (101,217)	$ (103,264)
Investing activities	(91,220)	(71,081)
Financing activities	1,295	98,075
Net decrease in cash, cash equivalents and restricted cash	$ (191,142)	$ (76,270)

Operating activities

Cash used in operating activities was $101.2 million during the year ended December 31, 2023, primarily resulting from a net loss of $125.0 million and accretion on marketable securities of $7.0 million, partially reduced by stock-based compensation expense of $26.2 million, depreciation and amortization expense of $3.7 million, and changes in operating assets and liabilities of $0.8 million. Net cash provided by changes in operating assets and liabilities consisted primarily of a decrease in operating lease assets and liabilities, net of $3.1 million primarily due to the receipt of $2.3 million in reimbursement from our landlord for tenant improvements and a decrease in prepaid expenses and other current and long-term assets of $0.9 million, partially offset by a decrease in accounts payable, accrued expenses and other current and long-term liabilities of $3.2 million.

Cash used in operating activities was $103.3 million during the year ended December 31, 2022, primarily resulting from a net loss of $242.8 million, partially reduced by in-process research and development expenses of $102.0 million, which are reflected in noncash and investing activities, stock-based compensation expense of $20.1 million, changes in operating assets and liabilities of $15.8 million and depreciation and amortization expense of $2.6 million. Net cash provided by changes in operating assets and liabilities consisted primarily of an increase in operating lease assets and liabilities, net of $13.7 million primarily due to the receipt of $14.2 million in reimbursement from our landlord for tenant improvements and an increase in accounts payable, accrued expenses and other current and long-term liabilities of $5.7 million, partially offset by an increase in prepaid expenses and other current and long-term assets of $3.6 million.

Investing activities

Net cash used in investing activities was $91.2 million during the year ended December 31, 2023 as compared to cash used in investing activities of $71.1 million during the year ended December 31, 2022. The increase in cash used in investing activities of $20.1 million was primarily the result of an increase in purchases of marketable securities of $182.1 million and an increase in in-process research and development of $18.0 million, partially offset by an increase in maturities of marketable securities of $165.1 million, and decreases in purchases of property and equipment of $12.8 million and payments made for investments in equity securities of $2.0 million.

Financing activities

Net cash provided by financing activities was $1.3 million during the year ended December 31, 2023 as compared to $98.1 million during the year ended December 31, 2022. During the year ended December 31, 2023, we received $0.8 million from the issuance of common stock under our Employee Stock Purchase Plan (ESPP) and $0.5 million from the exercise of stock options. During the year ended December 31, 2022, we received $95.3 million from the issuance of common stock in the 2022 Offering, net of underwriting discounts and commissions and offering costs, $2.0 million from the exercise of stock options, and $0.8 million from the issuance of common stock under our ESPP.

Cash requirements due to contractual obligations and other commitments

We lease office and laboratory space and certain laboratory equipment under lease agreements with varying expiration dates through 2032. As of December 31, 2023, total future aggregate operating lease commitments was $80.5 million, with approximately $8.8 million due in 2024, and the remaining due in periods from 2025 through 2032. See Note 11 to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K for further information.

We enter into contracts in the normal course of business for contract research services, contract manufacturing services, professional services and other services and products for operating purposes. These contracts generally provide for termination after a notice period, and, therefore, are cancelable contracts and not included in the table above.

Additionally, there are additional potential development and sales milestone payments and royalty payments we may be required to make under license and acquisition agreements we have entered into pursuant to which we have in-licensed and acquired certain intellectual property. For additional information regarding these agreements, see the section titled “Business—Our acquisition and license agreements” in this Annual Report on Form 10-K. The timing of when these additional payments will actually be made is uncertain as these payments are contingent upon the completion of future activities.

Critical accounting policies and estimates

This management discussion and analysis of financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with US GAAP. The preparation of these consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue and expenses. On an ongoing basis, we evaluate these estimates and judgments. We base our estimates on historical experience and on various assumptions that we believe to be reasonable under the circumstances. These estimates and assumptions form the basis for making judgments about the carrying values of assets and liabilities and the recording of revenue and expenses that are not readily apparent from other sources. Actual results may differ materially from these estimates.

While our significant accounting policies are described in more detail in Note 2 to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K, we believe that the following accounting policies are the most critical to understanding and evaluating our historical and future performance.

Accrued research and development expenses

We are required to make estimates of our accrued expenses resulting from our obligations under contracts with CROs, manufacturers, vendors and consultants, in connection with conducting research and development activities. The financial terms of these contracts vary from contract to contract and may result in payment flows that do not match the periods over which materials or services are provided under such contracts. We reflect research and development expenses in our consolidated financial statements by matching those expenses with the period in which services and efforts are expended.

We account for these expenses by reviewing open contracts and purchase orders, communicating with our personnel to identify services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of the actual cost. We make estimates of our accrued expenses as of each balance sheet date based on facts and circumstances known to us at that time. We periodically confirm the accuracy of our estimates with the service providers and make adjustments if necessary. The significant estimates in our accrued research and development expenses include the costs incurred for services performed by our vendors in connection with research and development activities for which we have not yet been invoiced.

We base our expenses related to research and development activities on our estimates of the services received and efforts expended pursuant to quotes and contracts with vendors that conduct research and development on our behalf. There may be instances in which payments made to our vendors will exceed the level of services provided and result in a prepayment of the research and development expense. In accruing service fees, we estimate the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from our estimate, we adjust the accrual or prepaid expense accordingly. Advance payments for goods and services that will be used in future research and development activities are expensed when the activity has been performed or when the goods have been received rather than when the payment is made.

Although we do not expect our estimates to be materially different from amounts actually incurred, if our estimates of the status and timing of services performed differ from the actual status and timing of services performed, it could result in us reporting amounts that are too high or too low in any particular period. To date, there have been no material differences between our estimates of such expenses and the amounts actually incurred.

Stock-based compensation

Stock-based compensation expense represents the cost of the grant date fair value of equity awards recognized over the requisite service period of the awards (usually the vesting period) on a straight-line basis. We estimate the fair value of stock option awards using the Black-Scholes option pricing model and recognize forfeitures as they occur.

The Black-Scholes option pricing model requires the use of subjective assumptions, including the risk-free interest rate, the expected stock price volatility, the expected term of stock options, and the expected dividend yield. Changes in these assumptions can materially affect the fair value and ultimately how much stock-based compensation expense is recognized. These inputs are subjective and generally require judgment to develop. See Note 10 to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K for information concerning certain of the specific assumptions we used in applying the Black-Scholes option pricing model to determine the estimated fair value of our stock options granted in the years ended December 31, 2023 and 2022.

Recently issued and adopted accounting pronouncements

See Note 2 to our consolidated financial statements included elsewhere in this Annual Report on Form 10-K for recently issued and adopted accounting pronouncements.

Emerging growth company and smaller reporting company status

As an emerging growth company under the Jumpstart Our Business Startups Act of 2012 (the JOBS Act), we can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have elected to avail ourselves of this exemption from new or revised accounting standards and, therefore, our consolidated financial statements may not be comparable to companies that comply with new or revised accounting pronouncements as of public company effective dates. We also intend to rely on other exemptions provided by the JOBS Act, including without limitation, not being required to comply with the auditor attestation requirements of Section 404(b) of the Sarbanes-Oxley Act of 2002 (Sarbanes-Oxley).

We will remain an emerging growth company until the earliest of (i) the last day of the fiscal year following the fifth anniversary of the consummation of our IPO; (ii) the last day of the fiscal year in which we have total annual gross revenue of at least $1.235 billion; (iii) the last day of the fiscal year in which we are deemed to be a “large accelerated filer” as defined in Rule 12b-2 under the Exchange Act, which would occur if the market value of our common stock held by non-affiliates exceeded $700.0 million as of the last business day of the second fiscal quarter of such year; or (iv) the date on which we have issued more than $1.0 billion in nonconvertible debt securities during the prior three-year period.

We are also a smaller reporting company as defined in the Exchange Act. We may continue to be a smaller reporting company even after we are no longer an emerging growth company. We may take advantage of certain of the scaled disclosures available to smaller reporting companies and will be able to take advantage of these scaled disclosures for so long as our voting and non-voting common stock held by non-affiliates is less than $250.0 million measured on the last business day of our second fiscal quarter, or our annual revenue is less than $100.0 million during the most recently completed fiscal year and our voting and non-voting common stock held by non-affiliates is less than $700.0 million measured on the last business day of our second fiscal quarter.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

Interest rate risk

We are exposed to market risk related to changes in interest rates of our investment portfolio of cash equivalents and marketable securities. As of December 31, 2023, our cash equivalents and marketable securities consisted of money market funds, US treasury securities, US government agency securities, corporate debt securities and commercial paper. Our primary exposure to market risk is interest income sensitivity, which is affected by changes in the general level of US interest rates. The fair value of our marketable securities is subject to change as a result of potential changes in market interest rates, including changes resulting from geopolitical and economic events. Due to the nature of our cash equivalents and marketable securities, we believe an immediate hypothetical 10% change in interest rates would not have had a material effect on our results of operations during the periods presented.

Foreign currency exchange risk

We are exposed to market risk related to changes in foreign currency exchange rates. We contract with vendors that are located outside the United States, and certain invoices are denominated in foreign currencies. We are subject to fluctuations in foreign currency rates in connection with these arrangements. To date, these fluctuations have not been significant and we have not had a formal hedging program with respect to foreign currency. We believe an immediate hypothetical 10% change in exchange rates would not have had a material effect on our results of operations during the periods presented.

Effects of inflation

Inflation generally affects us by increasing our cost of labor and research and development contract costs. We believe inflation has not had a material effect on our results of operations during the periods presented.

Item 8. Financial Statements and Supplementary Data.

The financial statements required to be filed pursuant to this Item 8 are appended to this Annual Report on Form 10-K. An index of those financial statements is found in Index to the Consolidated Financial Statements on page F-1 of this Annual Report on Form 10-K, as incorporated into Item 15, Exhibits and Financial Statement Schedules, of this Annual Report on Form 10-K, by reference.

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 periodic and current reports that we file with the SEC 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 principal executive officer and principal financial officer, as appropriate, to allow timely decisions regarding required disclosure. In designing and evaluating the disclosure controls and procedures, management recognized that any controls and procedures, no matter how well designed and operated, can provide only reasonable and not absolute assurance of achieving the desired control objectives. In reaching a reasonable level of assurance, management necessarily was required to apply its judgment in evaluating the cost-benefit relationship of possible controls and procedures. In addition, the design of any system of controls also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions; over time, controls may become inadequate because of changes in conditions, or the degree of compliance with policies or procedures may deteriorate. Because of the inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and not be detected.

Our management, with the participation of our principal executive officer and our principal financial officer, evaluated, as of the end of the period covered by this Annual Report on Form 10-K, the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act). Based on that evaluation, our principal executive officer and principal financial officer have concluded that, as of December 31, 2023, our disclosure controls and procedures were effective at the reasonable assurance level.

Management's Report and Attestation Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rule 13a-15(f) under the Exchange Act). Under the supervision of and with the participation of our principal executive officer and principal financial officer, our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2023, based on the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in Internal Control-Integrated Framework (2013). Based on this assessment, management concluded that our internal control over financial reporting was effective as of December 31, 2023.

This Annual Report on Form 10-K does not include an attestation report of our independent registered public accounting firm on our internal control over financial reporting due to an exemption established by the JOBS Act for emerging growth companies.

Changes in Internal Control Over Financial Reporting

There have been no changes in our internal control over financial reporting during the quarter ended December 31, 2023 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information.

From time to time, our officers (as defined in Rule 16a–1(f) of the Exchange Act) and directors may enter into Rule 10b5-1 or non-Rule 10b5-1 trading arrangements (as each such term is defined in Item 408 of Regulation S-K). During the three months ended December 31, 2023, none of our officers or directors adopted, modified or terminated any such trading arrangements.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections.

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by this Item 10 will be included in our Definitive Proxy Statement to be filed with the SEC, with respect to our 2024 Annual Meeting of Stockholders within 120 days of the end of our fiscal year (Definitive Proxy Statement), under the headings “Election of Directors,” “Corporate Governance,” “Executive Officers,” and “Section 16(a) Beneficial Ownership Reporting Compliance,” and is incorporated herein by reference.

Code of Business Conduct and Ethics

We have adopted a Code of Business Conduct and Ethics that applies to our officers, directors and employees, which is available on our website at www.erasca.com. The Code of Business Conduct and Ethics contains general guidelines for conducting the business of our company consistent with the highest standards of business ethics and is intended to qualify as a “code of ethics” within the meaning of Section 406 of Sarbanes-Oxley and Item 406 of Regulation S-K. In addition, we intend to promptly disclose (1) the nature of any amendment to our Code of Business Conduct and Ethics that applies to our principal executive officer, principal financial officer, principal accounting officer or controller or persons performing similar functions and (2) the nature of any waiver, including an implicit waiver, from a provision of our code of ethics that is granted to one of these specified officers, the name of such person who is granted the waiver and the date of the waiver on our website in the future.

Item 11. Executive Compensation

The information required by this Item 11 will be included in our Definitive Proxy Statement under the heading “Executive Compensation and Other Information,” and is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

The information required by this Item 12 will be included in our Definitive Proxy Statement under the heading “Security Ownership of Certain Beneficial Owners and Management,” and is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The information required by this Item 13 will be included in our Definitive Proxy Statement under the headings “Certain Relationships and Related Person Transactions,” “Board Independence” and “Committees of the Board of Directors” and is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services.

The information required by this Item 14 will be included in our Definitive Proxy Statement under the heading “Independent Registered Public Accountants’ Fees,” and is incorporated herein by reference.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

(1) For a list of the financial statements included herein, see Index to the Consolidated Financial Statements on page F-1 of this Annual Report on Form 10-K, incorporated into this Item by reference.

(2) Financial statement schedules have been omitted because they are either not required or not applicable or the information is included in the consolidated financial statements or the notes thereto.

(3) The exhibits filed as part of this Annual Report on Form 10-K are set forth on the Exhibit Index immediately preceding the signature page of this Annual Report on Form 10-K. The Exhibit Index is incorporated herein by reference.

Item 16. Form 10-K Summary.

None.

Index to Consolidated Financial Statements

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Erasca, Inc.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Erasca, Inc. and subsidiaries (the Company) as of December 31, 2023 and 2022, the related consolidated statements of operations and comprehensive loss, stockholders' equity, and cash flows for the years then ended, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2023 and 2022, and the results of its operations and its cash flows for the years then ended, in conformity with US generally accepted accounting principles.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the US 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 consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits, we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the consolidated 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 consolidated 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 consolidated financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as the Company's auditor since 2020.

San Diego, California
March 27, 2024

Erasca, Inc.
Consolidated Balance Sheets
(In thousands, except share and par value amounts)

	December 31, 2023	December 31, 2022
Assets		
Current assets:		
Cash and cash equivalents	$ 93,075	$ 284,217
Short-term marketable securities	219,275	151,403
Prepaid expenses and other current assets	8,326	8,876
Total current assets	320,676	444,496
Long-term marketable securities	9,642	—
Property and equipment, net	22,327	24,815
Operating lease assets	37,861	40,418
Restricted cash	408	408
Other assets	4,383	4,772
Total assets	$ 395,297	$ 514,909
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 2,000	$ 23,049
Accrued expenses and other current liabilities	20,186	24,336
Operating lease liabilities	3,970	1,305
Total current liabilities	26,156	48,690
Operating lease liabilities, net of current portion	51,889	53,793
Other liabilities	566	573
Total liabilities	78,611	103,056
Commitments and contingencies (Note 12)		
Stockholders' equity:		
Preferred stock, $0.0001 par value; 80,000,000 shares authorized at December 31, 2023 and 2022; no shares issued and outstanding at December 31, 2023 and 2022	—	—
Common stock, $0.0001 par value; 800,000,000 shares authorized at December 31, 2023 and 2022; 151,462,103 and 150,448,363 shares issued at December 31, 2023 and 2022, respectively; 151,090,227 and 149,333,258 shares outstanding at December 31, 2023 and 2022, respectively	15	15
Additional paid-in capital	922,607	893,850
Accumulated other comprehensive income (loss)	77	(1,041)
Accumulated deficit	(606,013)	(480,971)
Total stockholders' equity	316,686	411,853
Total liabilities and stockholders' equity	$ 395,297	$ 514,909

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

Erasca, Inc.
Consolidated Statements of Operations and Comprehensive Loss
(In thousands, except share and per share amounts)

	Year Ended December 31,	
	2023	2022
Operating expenses:		
Research and development	$ 103,821	$ 112,457
In-process research and development	—	102,000
General and administrative	37,704	32,993
Total operating expenses	141,525	247,450
Loss from operations	(141,525)	(247,450)
Other income (expense)		
Interest income	16,712	4,902
Other expense, net	(229)	(257)
Total other income (expense), net	16,483	4,645
Net loss	$ (125,042)	$ (242,805)
Net loss per share, basic and diluted	$ (0.83)	$ (1.99)
Weighted-average shares of common stock used in computing net loss per share, basic and diluted	150,184,994	122,024,848
Other comprehensive income (loss):		
Unrealized gain (loss) on marketable securities, net	1,118	(879)
Comprehensive loss	$ (123,924)	$ (243,684)

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

Erasca, Inc.
Consolidated Statements of Stockholders' Equity
(In thousands, except share data)

	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2021	121,382,547	$ 12	$ 694,844	$ (162)	$ (238,166)	$ 456,528
Issuance of common stock in underwritten offering, net of $5,117 in discounts and offering costs	15,384,616	2	94,881	—	—	94,883
Issuance of common stock in connection with license agreement	12,307,692	1	79,999	—	—	80,000
Exercise of stock options	1,177,571	—	2,004	—	—	2,004
Issuance of common stock under the Employee Stock Purchase Plan	202,882	—	820	—	—	820
Vesting of early exercised stock options	—	—	1,193	—	—	1,193
Repurchases of restricted stock	(6,945)	—	—	—	—	—
Stock-based compensation expense	—	—	20,109	—	—	20,109
Net loss	—	—	—	—	(242,805)	(242,805)
Unrealized loss on marketable securities, net	—	—	—	(879)	—	(879)
Balance at December 31, 2022	150,448,363	$ 15	$ 893,850	$ (1,041)	$ (480,971)	$ 411,853
Exercise of stock options	624,807	—	505	—	—	505
Issuance of common stock under the Employee Stock Purchase Plan	388,933	—	790	—	—	790
Vesting of early exercised stock options	—	—	1,231	—	—	1,231
Stock-based compensation expense	—	—	26,231	—	—	26,231
Net loss	—	—	—	—	(125,042)	(125,042)
Unrealized gain on marketable securities, net	—	—	—	1,118	—	1,118
Balance at December 31, 2023	151,462,103	$ 15	$ 922,607	$ 77	$ (606,013)	$ 316,686

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

Erasca, Inc.
Consolidated Statements of Cash Flows
(In thousands)

	Year Ended December 31,	
	2023	**2022**
Cash flows from operating activities:		
Net loss	$ (125,042)	$ (242,805)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	3,732	2,641
Stock-based compensation expense	26,231	20,109
In-process research and development expenses	—	102,000
Accretion on marketable securities, net	(6,951)	(994)
Changes in operating assets and liabilities:		
Prepaid expenses and other current and long-term assets	939	(3,612)
Accounts payable	(886)	676
Accrued expenses and other current and long-term liabilities	(2,301)	5,018
Operating lease assets and liabilities, net	3,061	13,703
Net cash used in operating activities	(101,217)	(103,264)
Cash flows from investing activities:		
Purchases of marketable securities	(314,390)	(132,330)
Maturities of marketable securities	244,945	79,800
In-process research and development	(20,000)	(2,000)
Payment made for investment in equity securities	—	(2,000)
Purchases of property and equipment, net	(1,775)	(14,551)
Net cash used in investing activities	(91,220)	(71,081)
Cash flows from financing activities:		
Proceeds from the issuance of common stock in underwritten offering, net of discounts and offering costs	—	95,251
Proceeds from the exercise of stock options	505	2,004
Proceeds from issuance of common stock under the Employee Stock Purchase Plan	790	820
Net cash provided by financing activities	1,295	98,075
Net decrease in cash, cash equivalents and restricted cash	(191,142)	(76,270)
Cash, cash equivalents and restricted cash at beginning of the period	284,625	360,895
Cash, cash equivalents and restricted cash at end of the period	$ 93,483	$ 284,625
Supplemental disclosure of noncash investing and financing activities:		
Issuance of common stock in connection with license agreement	$ —	$ 80,000
Amounts accrued for in-process research and development	$ —	$ 20,000
Amounts accrued for purchases of property and equipment	$ 13	$ 800
Amounts accrued for offering costs	$ —	$ 368
Vesting of early exercised options	$ 1,231	$ 1,193
Operating lease assets obtained in exchange for lease obligation	$ —	$ 22,704
Reduction in operating lease assets due to lease amendment	$ —	$ 3,361

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

Note 1. Organization and basis of presentation

Organization and nature of operations

Erasca, Inc. (Erasca or the Company) is a clinical-stage precision oncology company singularly focused on discovering, developing, and commercializing therapies for RAS/MAPK pathway-driven cancers. The Company has assembled a wholly-owned or controlled RAS/MAPK pathway-focused pipeline which is focused on modality-agnostic programs aligned with its three therapeutic strategies of: (1) targeting key upstream and downstream signaling nodes in the RAS/MAPK pathway; (2) targeting RAS directly; and (3) targeting escape routes that emerge in response to treatment. The Company was incorporated under the laws of the State of Delaware on July 2, 2018, as Erasca, Inc., and is headquartered in San Diego, California. In September 2020, the Company established a wholly-owned Australian subsidiary, Erasca Australia Pty Ltd (Erasca Australia), in order to conduct clinical activities in Australia for its development candidates. In November 2020, the Company entered into an agreement and plan of merger with Asana BioSciences, LLC (Asana) and ASN Product Development, Inc. (ASN) (the Asana Merger Agreement), pursuant to which ASN became the Company's wholly-owned subsidiary. In March 2021, the Company established a wholly-owned subsidiary, Erasca Ventures, LLC (Erasca Ventures), to make equity investments in early-stage biotechnology companies that are aligned with the Company’s mission and strategy.

Since inception, the Company has devoted substantially all of its efforts and resources to organizing and staffing the Company, business planning, raising capital, identifying, acquiring and in-licensing the Company’s product candidates, establishing its intellectual property portfolio, conducting research, preclinical studies, and clinical trials, establishing arrangements with third parties for the manufacture of its product candidates and related raw materials, and providing general and administrative support for these operations. As of December 31, 2023, the Company had $312.4 million in cash, cash equivalents, and short-term marketable securities, and $9.6 million in long-term marketable securities. As of December 31, 2023, the Company had an accumulated deficit of $606.0 million. The Company has incurred significant operating losses and negative cash flows from operations. From its inception through December 31, 2023, the Company’s financial support has primarily been provided from the sale of its convertible preferred stock and the sale of its common stock in its initial public offering (IPO) and underwritten offering (2022 Offering).

The Company expects to use its cash, cash equivalents, and marketable securities to fund research and development, working capital, and other general corporate purposes. The Company does not expect to generate any revenues from product sales unless and until the Company successfully completes development and obtains regulatory approval for any of its product candidates, which will not be for at least the next several years, if ever. Accordingly, until such time as the Company can generate significant revenue from sales of its product candidates, if ever, the Company expects to finance its cash needs through equity offerings, debt financings, or other capital sources, including potential collaborations, licenses or other similar arrangements. However, the Company may not be able to secure additional financing or enter into such other arrangements in a timely manner or on favorable terms, if at all. The Company’s failure to raise capital or enter into such other arrangements when needed would have a negative impact on the Company’s financial condition and could force the Company to delay, limit, reduce or terminate its research and development programs or other operations, or grant rights to develop and market product candidates that the Company would otherwise prefer to develop and market itself. The Company believes its cash, cash equivalents, and marketable securities as of December 31, 2023 will be sufficient for the Company to fund operations for at least one year from the issuance date of these consolidated financial statements.

Underwritten offering

In December 2022, the Company completed the 2022 Offering pursuant to which the Company issued and sold 15,384,616 shares of its common stock at a price to the public of $6.50 per share. Proceeds from the offering were $94.9 million, net of underwriting discounts and commissions and offering costs of $5.1 million.

Basis of presentation

The accompanying consolidated financial statements have been prepared in accordance with US generally accepted accounting principles (US GAAP). Any reference in these notes to applicable guidance is meant to refer to US GAAP as found in the Accounting Standards Codification (ASC) and Accounting Standards Updates (ASU) promulgated by the Financial Accounting Standards Board (FASB).

Principles of consolidation and foreign currency transactions

The Company's consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries, Erasca Australia, ASN, and Erasca Ventures. Erasca Australia was registered under the laws of Australia on September 1, 2020, ASN was incorporated under the laws of the State of Delaware on November 23, 2020, and Erasca Ventures was formed under the laws of the State of Delaware on March 30, 2021. All intercompany balances and transactions have been eliminated. The functional currency of the Company and its wholly-owned subsidiaries is the US dollar. Assets and liabilities that are not denominated in the functional currency are remeasured into US dollars at foreign currency exchange rates in effect at the balance sheet date except for nonmonetary assets, which are remeasured at historical foreign currency exchange rates in effect at the date of transaction. Net realized and unrealized gains and losses from foreign currency transactions and remeasurement are reported in other income (expense), in the consolidated statements of operations and comprehensive loss and were not material for all periods presented.

Note 2. Summary of significant accounting policies

Use of estimates

The preparation of the Company's consolidated financial statements in conformity with US GAAP requires the Company to make estimates and assumptions that impact the reported amounts of assets, liabilities, expenses, and the disclosure of contingent assets and liabilities in the consolidated financial statements and accompanying notes. Accounting estimates and management judgments reflected in the consolidated financial statements include, but are not limited to, the accrual of research and development expenses, stock-based compensation expense, and the incremental borrowing rate for determining the operating lease asset and liability. Management evaluates its estimates on an ongoing basis. Although estimates are based on the Company's historical experience, knowledge of current events, and actions it may undertake in the future, actual results may ultimately materially differ from these estimates and assumptions.

Concentration of credit risk and off-balance sheet risk

Financial instruments which potentially subject the Company to significant concentration of credit risk consist of cash and cash equivalents and marketable securities. The Company maintains deposits in federally insured financial institutions in excess of federally insured limits. The Company has not experienced any losses in such accounts, and management believes that the Company is not exposed to significant credit risk due to the financial position of the depository institutions in which those deposits are held. The Company's investment policy includes guidelines for the quality of the related institutions and financial instruments and defines allowable investments that the Company may invest in, which the Company believes minimizes the exposure to concentration of credit risk.

Cash, cash equivalents and restricted cash

Cash and cash equivalents include cash in readily available checking and savings accounts, and money market funds. The Company considers all highly liquid investments with an original maturity of three months or less from the date of purchase to be cash equivalents.

The Company had deposited cash of $408,000 as of December 31, 2023 and 2022 to secure a letter of credit in connection with the lease of the Company's facilities (see Note 11). The Company has classified the restricted cash as a noncurrent asset on its consolidated balance sheets.

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within the consolidated balance sheets that sum to the total of the same amounts shown in the consolidated statements of cash flows (in thousands):

	December 31,	
	2023	2022
Cash and cash equivalents	$ 93,075	$ 284,217
Restricted cash	408	408
Total cash, cash equivalents and restricted cash	$ 93,483	$ 284,625

Marketable securities and investments

The Company classifies all marketable securities as available-for-sale, as the sale of such securities may be required prior to maturity. Management determines the appropriate classification of its marketable securities at the time of purchase. Marketable securities with original maturities beyond three months at the date of purchase and which mature at, or less than 12 months from, the balance sheet date are classified as short-term marketable securities. Available-for-sale securities are carried at fair value, with the unrealized gains and losses reported as accumulated other comprehensive income (loss) until realized. The amortized cost of available-for-sale debt securities is adjusted for amortization of premiums and accretion of discounts to maturity. Such amortization and accretion are included in interest income. The Company regularly reviews all of its marketable securities for declines in fair value. The review includes the consideration of the cause of the impairment, including the creditworthiness of the security issuers, the number of securities in an unrealized loss position, the severity of the unrealized loss(es), whether the Company has the intent to sell the securities and whether it is more likely than not that the Company will be required to sell the securities before the recovery of their amortized cost basis. If the decline in fair value is due to credit-related factors, a loss is recognized in net income; whereas, if the decline in fair value is not due to credit-related factors, the loss is recorded in other comprehensive income (loss). Realized gains and losses on available-for-sale securities are included in other income or expense. The cost of securities sold is based on the specific identification method. Interest and dividends on securities classified as available-for-sale are included in interest income.

Through its wholly-owned subsidiary, Erasca Ventures, the Company has also invested in equity securities of a company whose securities are not publicly traded and whose fair value is not readily available (see Notes 3 and 17). This investment is recorded using cost minus impairment, plus or minus changes in its estimated fair value resulting from observable price changes in orderly transactions for the identical or a similar investment of the same issuer. Investments in equity securities without readily determinable fair values are assessed for potential impairment on a quarterly basis based on qualitative factors. This investment is included in other assets in the Company's consolidated balance sheets.

Fair value measurements

Certain assets and liabilities are carried at fair value under US GAAP. Fair value is defined as an exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or liability. Financial assets and liabilities carried at fair value are classified and disclosed in one of the following three levels of the fair value hierarchy, of which the first two are considered observable and the last is considered unobservable:

Level 1—Unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets or liabilities.

Level 2—Quoted prices for similar assets and liabilities in active markets, quoted prices in markets that are not active, or inputs which are observable, either directly or indirectly, for substantially the full term of the asset or liability.

Level 3—Prices or valuation techniques that require inputs that are both significant to the fair value measurement and unobservable (i.e., supported by little or no market activity).

Property and equipment, net

Property and equipment are stated at cost less accumulated depreciation. Depreciation and amortization are calculated using the straight-line method over the estimated useful lives of the respective assets, generally three to seven years.

Leasehold improvements are amortized over the shorter of the estimated useful lives of the assets or the remaining lease term.

Impairment of long-lived assets

The Company continually evaluates long-lived assets for potential impairment when events or changes in circumstances indicate the carrying value of the assets may not be recoverable. Recoverability is measured by comparing the book values of the assets to the expected future net undiscounted cash flows that the assets are expected to generate. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the book values of the assets exceed their fair value. The Company did not recognize any impairment losses for the years ended December 31, 2023 and 2022.

Leases

The Company leases real estate facilities and equipment under non-cancelable and cancelable operating leases with various expiration dates through fiscal year 2032. At the inception of an arrangement, the Company determines whether the arrangement is or contains a lease based on the unique facts and circumstances present, the existence of an identified asset(s), if any, and the Company's control over the use of the identified asset(s), if applicable. Operating leases are included in operating lease assets and in operating lease liabilities in the accompanying consolidated balance sheets. Operating lease assets represent the Company's right to use an underlying asset for the lease term, and lease liabilities represent the Company's obligation to make lease payments arising from the lease.

Operating lease liabilities are recognized at the lease commencement date based on the present value of lease payments over the lease term discounted based on the more readily determinable of (i) the rate implicit in the lease or (ii) the Company's incremental borrowing rate (which is the estimated rate the Company would be required to pay for a collateralized borrowing equal to the total lease payments over the term of the lease). Because the Company's operating leases generally do not provide an implicit rate, the Company estimates its incremental borrowing rate based on the information available at lease commencement date for borrowings with a similar term.

The Company's operating lease assets are measured based on the corresponding operating lease liability adjusted for (i) payments made to the lessor at or before the commencement date, (ii) initial direct costs incurred and (iii) tenant incentives under the lease. The Company does not assume renewals or early terminations unless it is reasonably certain to exercise these options at commencement. The Company elected the practical expedient which allows the Company to not allocate consideration between lease and non-lease components. Variable lease payments are recognized in the period in which the obligations for those payments are incurred. In addition, the Company elected the practical expedient such that it does not recognize lease assets or lease liabilities for leases with a term of 12 months or less for all asset classes. Operating lease expense is recognized on a straight-line basis over the lease term. Certain of the Company's real estate leases include tenant improvement allowances, which are recognized as lease incentives and amortized on a straight-line basis over the lease term as an offset to rent expense.

Research and development expense

Research and development expenses consist of external and internal costs associated with the Company's research and development activities, including its discovery and research efforts and the preclinical and clinical development of its product candidates. Research and development costs are expensed as incurred. The Company's research and development expenses include external costs, consisting of expenses incurred under arrangements with third parties, such as contract research organizations (CROs), contract manufacturing organizations (CMOs), consultants and its scientific advisors; and internal costs, consisting of employee-related expenses, including salaries, benefits, and stock-based compensation for those individuals involved in research and development efforts, the costs of laboratory supplies and acquiring, developing and manufacturing preclinical study materials, and facilities and depreciation, which include direct and allocated expenses for rent of facilities and depreciation.

The Company records accruals for estimated research and development costs, comprising payments for work performed by third party contractors, laboratories, and others. Some of these contractors bill monthly based on actual services performed, while others bill periodically based upon achieving certain contractual milestones. For the latter, the Company accrues the expenses as goods or services are used or rendered. Non-refundable advance payments for goods or services that will be used or rendered for future research and development activities are deferred and capitalized as prepaid expenses until the related goods are delivered or services are performed.

In-process research and development expense

The Company has acquired rights as part of asset acquisitions or in-licenses to develop and commercialize product candidates. Upfront payments that relate to the acquisition of a new product candidate, as well as pre-commercial milestone payments, are immediately expensed as in-process research and development (IPR&D) in the period in which they are incurred, provided that the new product candidate did not also include processes or activities that would constitute a “business” as defined under US GAAP, the product candidate has not achieved regulatory approval for marketing and, absent obtaining such approval, has no established alternative future use. The Company accounts for contingent consideration payable upon achievement of certain regulatory, development or sales milestones in such asset acquisitions when the underlying contingency is probable and estimable. Milestone payments made to third parties subsequent to regulatory approval will be capitalized as intangible assets and amortized over the estimated remaining useful life of the related product.

Patent costs

The Company expenses all costs as incurred in connection with patent applications (including direct application fees, and the legal and consulting expenses related to making such applications) and such costs are included in general and administrative expenses in the consolidated statements of operations and comprehensive loss.

Stock-based compensation

The Company measures employee and nonemployee stock-based awards based on the fair value on the date of grant and records compensation expense on a straight-line basis over the requisite service period of the award. All stock-based compensation costs are recorded in the consolidated statements of operations and comprehensive loss based upon the underlying employees' or nonemployees' roles within the Company. Forfeitures are accounted for as they occur.

The fair value of stock option grants and shares purchasable under the Company's 2021 Employee Stock Purchase Plan (ESPP) is estimated on the date of grant using the Black-Scholes options-pricing model, which requires inputs based on certain subjective assumptions, including the:

- Risk-free interest rate. The risk-free interest rate is based on the US Treasury zero-coupon issues in effect at the time of grant for periods corresponding with the expected term of the stock-based awards.

- Expected volatility. Given that the Company’s common stock was privately held prior to the IPO, there was no active trading market for its common stock. The Company derived the expected volatility from the average historical volatilities over a period approximately equal to the expected term of comparable publicly traded companies within its peer group that were deemed to be representative of future stock price trends. The Company will continue to apply this process until a sufficient amount of historical information regarding the volatility of its own stock price becomes available.

- Expected term. The expected term represents the period that the stock-based awards are expected to be outstanding. The expected term of stock options issued is determined using the simplified method (based on the mid-point between the vesting date and the end of the contractual term) as the Company has concluded that its stock option exercise history does not provide a reasonable basis upon which to estimate expected term.

- Expected dividend yield. The Company has never paid dividends on its common stock and does not anticipate paying any dividends in the foreseeable future. Therefore, the Company used an expected dividend yield of zero.

The fair value of each restricted common stock award is estimated on the date of grant based on the fair value of the Company’s common stock on that same date.

Income taxes

The Company recognizes deferred tax assets and liabilities for the expected future tax consequences of events that have been recognized in the Company's consolidated financial statements or tax returns. Under this method, deferred tax assets and liabilities are determined based on differences between the financial statement carrying amounts and the tax bases of the assets and liabilities using the enacted tax rates in effect in the years in which the differences are expected to reverse. A valuation allowance against deferred tax assets is recorded if, based on the weight of the available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

The Company accounts for uncertainty in income taxes recognized in the consolidated financial statements by applying a two-step process to determine the amount of tax benefit to be recognized. First, the tax position must be evaluated to determine the likelihood that it will be sustained upon external examination by the taxing authorities. If the tax position is deemed more-likely-than-not to be sustained, the tax position is then assessed to determine the amount of benefit to recognize in the consolidated financial statements. The amount of the benefit that may be recognized is the largest amount that has a greater than 50% likelihood of being realized upon ultimate settlement. The provision for income taxes includes the effects of any resulting tax reserves, or unrecognized tax benefits, that are considered appropriate as well as the related net interest and penalties. As of December 31, 2023, the Company's tax years since inception are subject to examination by taxing authorities due to the Company's unutilized net operating losses and tax credits.

Comprehensive income (loss)

The Company reports all components of comprehensive income (loss), including net loss, in the consolidated financial statements in the period in which they are recognized. Comprehensive income (loss) is defined as the change in equity during a period from transactions and other events and circumstances from non-owner sources, including unrealized gains and losses on marketable securities. Other comprehensive income (loss) includes unrealized gains and losses on marketable securities, which was the only difference between net loss and comprehensive loss for the applicable periods.

Net loss per share

The Company's net loss is equivalent to net loss attributable to common stockholders for all periods presented. Basic net loss per share is calculated by dividing the net loss by the weighted-average number of common shares outstanding during the period, without consideration of potentially dilutive securities. Diluted net loss per share is computed by dividing the net loss by the weighted-average number of common shares and potentially dilutive securities outstanding for the period. For purposes of the diluted net loss per share calculation, options to purchase common stock, shares purchasable under the ESPP and common stock subject to repurchase related to options early exercised are considered to be potentially dilutive securities. Basic and diluted net loss per share is presented in conformity with the two-class method required for participating securities as the shares issued upon the early exercise of stock options subject to repurchase are considered to be participating securities because holders of such shares have non-forfeitable dividend rights in the event a dividend is paid on common stock. The Company's participating securities do not have a contractual obligation to share in the Company's losses. As such, the net loss was attributed entirely to common stockholders. As the Company has reported a net loss for all periods presented, diluted net loss per common share is the same as basic net loss per common share for those periods, since dilutive common shares are not assumed to have been issued if their effect is anti-dilutive.

Segments

The Company has determined that its chief executive officer is the chief operating decision maker (CODM). The Company operates and manages the business as one reporting and one operating segment, which is the business of discovering and developing precision medicines for the benefit of patients with cancer. The Company's CODM reviews financial information on an aggregate basis for purposes of allocating resources and evaluating financial performance. All of the Company's assets are located in the United States.

Recently adopted accounting pronouncements

There were no accounting pronouncements adopted by the Company during the year ended December 31, 2023.

Recently issued accounting pronouncements not yet adopted

From time to time, new accounting pronouncements are issued by the FASB or other standard setting bodies that the Company adopts as of the specified effective date. The Company qualifies as an “emerging growth company” as defined in the Jumpstart Our Business Startups Act of 2012 (JOBS Act) and has elected not to “opt out” of the extended transition related to complying with new or revised accounting standards, which means that when a standard is issued or revised and it has different application dates for public and nonpublic companies, the Company can adopt the new or revised standard at the time nonpublic companies adopt the new or revised standard and can do so until such time that the Company either (i) irrevocably elects to “opt out” of such extended transition period or (ii) no longer qualifies as an emerging growth company.

In November 2023, the FASB issued ASU 2023-07, Segment Reporting (Topic 280): Improvements to Reportable Segment Disclosures, which is intended to provide enhancements to segment disclosures, even for entities with only one reportable segment. In particular, the standard will require disclosures of significant segment expenses regularly provided to the chief operating decision maker and included within each reported measure of segment profit and loss. The standard will also require disclosure of all other segment items by reportable segment and a description of its composition. Finally, the standard will require disclosure of the title and position of the chief operating decision maker and an explanation of how the chief operating decision maker uses the reported measure(s) of segment profit or loss in assessing segment performance and deciding how to allocate resources. The standard is effective for annual periods beginning after December 15, 2023, and interim periods within annual periods beginning after December 15, 2024. Early adoption is permitted. Retrospective application to all prior periods presented in the financial statements is required. The Company is currently evaluating the impact of the standard on the presentation of its consolidated financial statements and related disclosures.

In December 2023, the FASB issued ASU 2023-09, Income Taxes (Topic 740): Improvements to Income Tax Disclosures, which is intended to provide enhancements to annual income tax disclosures. In particular, the standard will require more detailed information in the income tax rate reconciliation, as well as the disclosure of income taxes paid disaggregated by jurisdiction, among other enhancements. The standard is effective for the Company in its annual period beginning after December 15, 2025 and early adoption is permitted. The standard allows for adoption on a prospective basis, with a retrospective option. The Company is currently evaluating the impact of the standard on the presentation of its consolidated financial statements and related disclosures.

Note 3. Fair value measurements

The following tables summarize the Company’s financial assets measured at fair value on a recurring basis and their respective input levels based on the fair value hierarchy (in thousands):

		Fair value measurements as of December 31, 2023 using		
	December 31, 2023	Quoted prices in active markets for identical assets (level 1)	Significant other observable inputs (level 2)	Significant unobservable inputs (level 3)
Assets:				
Money market funds[1]	$ 83,101	$ 83,101	$ —	$ —
US treasury securities[2]	93,303	93,303	—	—
US government agency securities[2]	26,824	—	26,824	—
Corporate debt securities[2]	10,734	—	10,734	—
Commercial paper[2]	88,414	—	88,414	—
US treasury securities[3]	9,642	9,642	—	—
Total fair value of assets	$ 312,018	$ 186,046	$ 125,972	$ —

(1) Included as cash and cash equivalents on the consolidated balance sheets.
(2) Included as short-term marketable securities on the consolidated balance sheets.
(3) Included as long-term marketable securities on the consolidated balance sheets.

	December 31, 2022	Fair value measurements as of December 31, 2022 using: Quoted prices in active markets for identical assets (level 1)	Significant other observable inputs (level 2)	Significant unobservable inputs (level 3)
Assets:				
Money market funds[1]	$ 255,080	$ 255,080	$ —	$ —
US treasury securities[2]	127,476	127,476	—	—
US government agency securities[2]	1,468	—	1,468	—
Corporate debt securities[2]	3,301	—	3,301	—
Commercial paper[2]	18,519	—	18,519	—
Supranational debt securities[2]	639	—	639	—
Total fair value of assets	$ 406,483	$ 382,556	$ 23,927	$ —

(1) Included as cash and cash equivalents on the consolidated balance sheets.
(2) Included as short-term marketable securities on the consolidated balance sheets.

The carrying amounts of the Company's financial instruments, including cash, prepaid expenses and other current assets, accounts payable, and accrued expenses and other current liabilities, approximate fair value due to their short maturities. As of December 31, 2023 and 2022, the Company held a $2.0 million equity investment in Affini-T Therapeutics, Inc. (Affini-T) at cost. No adjustments have been made to the value of the Company's investment in Affini-T since its initial measurement either due to impairment or based on observable price changes. None of the Company's non-financial assets or liabilities are recorded at fair value on a non-recurring basis. No transfers between levels have occurred during the periods presented.

Cash equivalents consist of money market funds, short-term marketable securities consist of US treasury securities, US government agency securities, corporate debt securities, commercial paper, and supranational debt securities, and long-term marketable securities consist of US treasury securities. The Company obtains pricing information from its investment manager and generally determines the fair value of marketable securities using standard observable inputs, including benchmark yields, reported trades, broker/dealer quotes, issuer spreads, two-sided markets, benchmark securities, and bid and/or offers.

Note 4. Marketable securities

The following tables summarize the Company's marketable securities accounted for as available-for-sale securities (in thousands, except years):

	December 31, 2023				
	Maturity (in years)	Amortized cost	Unrealized gains	Unrealized losses	Estimated fair value
US treasury securities	1 or less	$ 93,377	$ 74	$ (148)	$ 93,303
US government agency securities	1 or less	26,783	45	(4)	26,824
Corporate debt securities	1 or less	10,719	15	—	10,734
Commercial paper	1 or less	88,356	68	(10)	88,414
US treasury securities	1-2	9,605	37	—	9,642
Total		$ 228,840	$ 239	$ (162)	$ 228,917

	December 31, 2022				
	Maturity (in years)	Amortized cost	Unrealized gains	Unrealized losses	Estimated fair value
US treasury securities	1 or less	$ 128,504	$ 5	$ (1,033)	$ 127,476
US government agency securities	1 or less	1,467	1	—	1,468
Corporate debt securities	1 or less	3,309	—	(8)	3,301
Commercial paper	1 or less	18,519	—	—	18,519
Supranational debt securities	1 or less	645	—	(6)	639
Total		$ 152,444	$ 6	$ (1,047)	$ 151,403

The following tables present fair values and gross unrealized losses for those available-for-sale securities that were in an unrealized loss position as of December 31, 2023 and 2022, aggregated by category and the length of time that the securities have been in a continuous loss position (in thousands):

	December 31, 2023					
	Unrealized losses less than 12 months		Unrealized losses 12 months or greater		Total	
	Fair value	Unrealized losses	Fair value	Unrealized losses	Fair value	Unrealized losses
US treasury securities	$ 74,912	$ (148)	$ —	$ —	$ 74,912	$ (148)
US government agency securities	6,950	(4)	—	—	6,950	(4)
Corporate debt securities	748	—	—	—	748	—
Commercial paper	22,944	(10)	—	—	22,944	(10)
Total	$105,554	$ (162)	$ —	$ —	$105,554	$ (162)

	December 31, 2022					
	Unrealized losses less than 12 months		Unrealized losses 12 months or greater		Total	
	Fair value	Unrealized losses	Fair value	Unrealized losses	Fair value	Unrealized losses
US treasury securities	$ 60,652	$ (129)	$ 44,048	$ (904)	$104,700	$ (1,033)
Corporate debt securities	2,560	(8)	—	—	2,560	(8)
Supranational debt securities	639	(6)	—	—	639	(6)
Total	$ 63,851	$ (143)	$ 44,048	$ (904)	$107,899	$ (1,047)

As of December 31, 2023, there were 22 available-for-sale securities with an estimated fair value of $105.6 million in gross unrealized loss positions, none of which were in an unrealized loss position for more than 12 months. As of December 31, 2022, there were 35 available-for-sale securities with an estimated fair value of $107.9 million in gross unrealized loss positions, of which 10 available-for-sale securities with an estimated fair value of $44.0 million were in an unrealized loss position for more than 12 months.

As of December 31, 2023 and 2022, unrealized losses on available-for-sale securities are not attributed to credit risk. The Company believes that an allowance for credit losses is unnecessary because the unrealized losses on certain of the Company's available-for-sale securities are due to market factors and interest rate increases. Additionally, the Company does not intend to sell the securities nor is it more likely than not that the Company will be required to sell the securities before recovery of their amortized cost basis.

Accrued interest on the Company's available-for-sale securities was $1.1 million and $748,000 as of December 31, 2023 and 2022, respectively, and is included in prepaid expenses and other current assets on the consolidated balance sheets.

Note 5. Property and equipment, net

Property and equipment, net consisted of the following (in thousands):

	December 31, 2023	December 31, 2022
Laboratory equipment	$ 5,620	$ 4,815
Furniture and fixtures	4,099	4,104
Leasehold improvements	18,173	17,837
Computer equipment and software	1,667	1,559
Property and equipment	29,559	28,315
Less accumulated depreciation and amortization	(7,232)	(3,500)
Property and equipment, net	$ 22,327	$ 24,815

Depreciation and amortization expense related to property and equipment was $3.7 million and $2.6 million for the years ended December 31, 2023 and 2022, respectively.

Note 6. Accrued expenses and other current liabilities

Accrued expenses and other current liabilities consisted of the following (in thousands):

	December 31, 2023	December 31, 2022
Accrued research and development expenses	$ 8,803	$ 11,523
Accrued compensation	10,311	9,395
Unvested early exercised stock option liability	464	1,690
Accrued professional services	435	873
Accrued property and equipment	13	638
Other accruals	160	217
Total	$ 20,186	$ 24,336

Note 7. Asset acquisitions

The following purchased assets were accounted for as asset acquisitions as substantially all of the fair value of the assets acquired were concentrated in a group of similar assets, and the acquired assets did not have outputs or employees. Because the assets had not yet received regulatory approval, the fair value attributable to these assets was recorded as in-process research and development expenses in the Company's consolidated statements of operations and comprehensive loss.

Asana BioSciences, LLC

In November 2020, the Company entered into the Asana Merger Agreement, pursuant to which ASN became its wholly-owned subsidiary. Asana and ASN had previously entered into a license agreement, which was amended and restated prior to the closing of the merger transaction (the Asana License Agreement, and collectively with the Asana Merger Agreement, the Asana Agreements), pursuant to which ASN acquired an exclusive, worldwide license to certain intellectual property rights relating to inhibitors of ERK1 and ERK2 owned or controlled by Asana to develop and commercialize ERAS-007 and certain other related compounds for all applications.

Under the Asana Merger Agreement, in 2020, the Company made an upfront payment of $20.0 million and issued 4,000,000 shares of its Series B-2 convertible preferred stock to Asana at a value of $7.50 per share or a total fair value of equity of $30.0 million. In connection with the Company's IPO, these shares of Series B-2 convertible preferred stock were converted into 3,333,333 shares of the Company's common stock. The Company is obligated to make future development and regulatory milestone cash payments for a licensed product in an amount of up to $90.0 million. Additionally, upon achieving a development milestone related to demonstration of successful proof-of-concept in a specified clinical trial, the Company will also be required to issue 3,888,889 shares of its common stock to Asana. The Company is not obligated to pay royalties on the net sales of licensed products. No IPR&D expense was recorded during the years ended December 31, 2023 and 2022. As of December 31, 2023 and 2022, no milestones had been accrued as the underlying contingencies were not probable or estimable.

Emerge Life Sciences, Pte. Ltd.

In March 2021, the Company entered into an asset purchase agreement (ELS Purchase Agreement) with Emerge Life Sciences, Pte. Ltd. (ELS) wherein it purchased all rights, title, and interest (including all patent and other intellectual property rights) to EGFR antibodies directed against the EGFR domain II (EGFR-D2) and domain III (EGFR-D3) as well as a bispecific antibody where one arm is directed against EGFR-D2 and the other is directed against EGFR-D3 (the Antibodies). Under the terms of the ELS Purchase Agreement, in 2021, the Company made an upfront payment of $2.0 million and issued to ELS 500,000 shares of the Company's common stock at a value of $3.36 per share or a total fair value of equity of $1.7 million. No IPR&D expense was recorded during the years ended December 31, 2023 and 2022.

Note 8. License agreements

Novartis Pharma AG

In December 2022, the Company entered into an exclusive license agreement (as amended, the Novartis Agreement) with Novartis Pharma AG (Novartis) under which the Company was granted an exclusive, worldwide, royalty-bearing license to certain patent and other intellectual property rights owned or controlled by Novartis to develop, manufacture, use, and commercialize naporafenib in all fields of use. The Company has the right to sublicense (through multiple tiers) its rights under the Novartis Agreement, subject to certain limitations and conditions, and is required to use commercially reasonable efforts to commercialize licensed products in certain geographical markets. The license granted under the Novartis Agreement is subject to Novartis' reserved right to: (i) develop, manufacture, use, and commercialize compounds unrelated to naporafenib under the licensed patent rights and know-how, (ii) use the licensed patent rights and know-how for non-clinical research purposes, and (iii) use the licensed patent rights and know-how to the extent necessary to perform ongoing clinical trials and perform its obligations under existing contracts and under the Novartis Agreement.

Under the Novartis Agreement, the Company made an upfront cash payment to Novartis of $20.0 million and issued to Novartis 12,307,692 shares of common stock of the Company having an aggregate value of approximately $80.0 million. The Company is obligated to make future regulatory milestone payments of up to $80.0 million and sales milestone payments of up to $200.0 million. The Company is also obligated to pay royalties on net sales of all licensed products, in the low-single digit percentages, subject to certain reductions. The Company recorded $0 and $100.0 million in IPR&D expense during the years ended December 31, 2023 and 2022, respectively, in connection with the Novartis Agreement. As of December 31, 2023 and 2022, the Company had recorded $0 and $20.0 million in accounts payable on the consolidated balance sheets related to the upfront cash payment, respectively. As of December 31, 2023 and 2022, no milestones are accrued as the underlying contingencies are not probable or estimable.

Katmai Pharmaceuticals, Inc.

In March 2020, the Company entered into a license agreement (the Katmai Agreement) with Katmai Pharmaceuticals, Inc. (Katmai) under which the Company was granted an exclusive, worldwide, royalty-bearing license to certain patent rights and know-how controlled by Katmai related to the development of small molecule therapeutic and diagnostic products that modulate EGFR and enable the identification, diagnosis, selection, treatment, and/or monitoring of patients for neuro-oncological applications to develop, manufacture, use, and commercialize ERAS-801 and certain other related compounds in all fields of use.

Under the Katmai Agreement, the Company made an upfront payment of $5.7 million and Katmai agreed to purchase shares of the Company's Series B-1 convertible preferred stock and Series B-2 convertible preferred stock having an aggregate value of $2.7 million. In April 2020, Katmai purchased 356,000 shares of the Company's Series B-1 convertible preferred stock for $1.8 million, and in January 2021, Katmai purchased 118,666 shares of the Company's Series B-2 convertible preferred stock for $0.9 million. In connection with the Company's IPO, these shares of Series B-1 convertible preferred stock and Series B-2 convertible preferred stock were converted into 395,555 shares of the Company's common stock, in the aggregate. The Company is obligated to make future development and regulatory milestone payments of up to $26.0 million, of which $2.0 million was paid in March 2022, and commercial milestone payments of up to $101.0 million. The Company is also obligated to pay tiered royalties on net sales of each licensed product, at rates ranging from the mid- to high-single digit percentages, subject to a minimum annual royalty payment in the low six figures and certain permitted deductions. The Company recorded IPR&D expense of $2.0 million in connection with a development milestone payment made during the year ended December 31, 2022. No IPR&D expense was recorded during the year ended December 31, 2023. As of December 31, 2023 and 2022, no milestones are accrued as the underlying contingencies are not probable or estimable.

NiKang Therapeutics, Inc.

In February 2020, the Company entered into a license agreement (the NiKang Agreement) with NiKang Therapeutics, Inc. (NiKang) under which the Company was granted an exclusive, worldwide license to certain intellectual property rights owned or controlled by NiKang related to certain SHP2 inhibitors to develop and commercialize ERAS-601 and certain other related compounds for all applications.

Under the NiKang Agreement, in 2020, the Company made an upfront payment of $5.0 million to NiKang and reimbursed NiKang $0.4 million for certain initial manufacturing costs. In addition, the Company paid $7.0 million in 2020 related to the publication of a US patent application that covered the composition of matter of ERAS-601. The Company is also obligated to pay (i) development and regulatory milestone payments in an aggregate amount of up to $16.0 million for the first licensed product, of which $4.0 million was paid in January 2021, and $12.0 million for a second licensed product, and (ii) commercial milestone payments in an aggregate amount of up to $157.0 million for the first licensed product and $151.0 million for a second licensed product. The Company is also obligated to: (i) pay tiered royalties on net sales of all licensed products in the mid-single digit percentages, subject to certain reductions; and (ii) equally split all net sublicensing revenues earned under sublicense agreements that the Company enters into with any third party before commencement of the first Phase I clinical trial for a licensed product. No IPR&D expense was recorded during the years ended December 31, 2023 and 2022. As of December 31, 2023 and 2022, no milestones are accrued as the underlying contingencies are not probable or estimable.

LifeArc

In April 2020, the Company entered into a license agreement with LifeArc (the LifeArc Agreement) under which the Company was granted an exclusive, worldwide license to certain materials, know-how, and intellectual property rights owned or controlled by LifeArc to develop, manufacture, use, and commercialize certain ULK inhibitors for all applications.

Under the LifeArc Agreement, the Company was granted the license at no upfront cost and a period of three months after the effective date to conduct experiments on LifeArc's compounds. Upon completion of this initial testing period, the Company had the option to continue the license and make a one-time license payment of $75,000 to LifeArc, which payment was subsequently made in 2020. The Company is obligated to make future development milestone payments for a licensed product of up to $11.0 million and sales milestone payments of up to $50.0 million. The Company is also obligated to pay royalties on net sales of all licensed products, in the low-single digit percentages, subject to certain reductions. No IPR&D expense was recorded during the years ended December 31, 2023 and 2022. As of December 31, 2023 and 2022, no milestones are accrued as the underlying contingencies are not probable or estimable.

University of California, San Francisco

In December 2018, the Company entered into a license agreement, as amended (the UCSF Agreement), with The Regents of the University of California, San Francisco (the Regents), under which the Company was granted an exclusive, worldwide, royalty-bearing license under certain patent rights claiming novel covalent inhibitors of GTP- and GDP-bound RAS for the development and commercialization of products covered by such patent rights for the prevention, treatment and amelioration of human cancers and other diseases and conditions. The UCSF Agreement was amended in May 2021.

Under the UCSF Agreement, the Company made upfront payments of $50,000 to the Regents and paid the Regents an annual license maintenance fee during the term of the license, but such fee would not have been due on any anniversary if, on that date, the Company was then making royalty payments to the Regents. The Company was obligated to make future development and regulatory milestone payments of up to $6.4 million and a sales milestone payment of $2.0 million for either of the first two licensed products. The Company was also obligated to pay royalties on net sales of all licensed products in the low-single digit percentages, subject to a minimum annual royalty payment in the low six figures, commencing on the year of the first sale of a licensed product and continuing, on a licensed product-by-licensed product and country-by-country basis, until there were no valid claims of the licensed patent rights covering the licensed product in such country.

Additionally, the Company was obligated to pay tiered sublicensing fees, with the first two tiers in the low-to-mid teen percentages and the third tier at 30%, on certain fees the Company received from any sublicense that the Company granted, depending on the stage of development of a licensed product when such sublicense was granted. Prior to the execution of the amendment, the Company was obligated to make a cash payment to the Regents in the event of the Company's initial public offering, a change of control transaction or a reverse merger (the Corporate Milestone). In the amendment, the amount of the cash payment payable upon the Company's achievement of a Corporate Milestone was reduced and the Company agreed to issue the Regents 944,945 shares of the Company's common stock, which issuance was not contingent upon the achievement of a Corporate Milestone and occurred in May 2021. In August 2021, following the achievement of the Corporate Milestone, the Company made a cash payment to the Regents in the amount of $1.7 million. No IPR&D expense was recorded during the years ended December 31, 2023 and 2022. As of December 31, 2023 and 2022, no milestones are accrued as the underlying contingencies are not probable or estimable.

On August 7, 2023, the Company sent a notice of termination to the Regents with respect to the UCSF Agreement. The termination of the UCSF Agreement, including termination of the exclusive license granted to the Company under the UCSF Agreement, was effective as of October 6, 2023.

Note 9. Stockholders' equity

Common stock

Holders of the Company's common stock are entitled to one vote for each share held on the applicable record date with respect to all matters submitted to a vote of stockholders, including the election of directors, and do not have cumulative voting rights. Common stockholders are entitled to receive dividends, as may be declared by the Company's board of directors. As of December 31, 2023, no dividends had been declared.

In August 2022, the Company entered into an Open Market Sale Agreement (the Sale Agreement) with Jefferies LLC (the Agent), pursuant to which the Company may offer and sell shares of the Company's common stock having an aggregate offering price of up to $200 million from time to time, in "at the market" offerings through the Agent. Sales of the shares of common stock, if any, will be made at prevailing market prices at the time of sale, or as otherwise agreed with the Agent. The Agent will receive a commission from the Company of up to 3.0% of the gross proceeds of any shares of common stock sold under the Sale Agreement. There have been no shares of the Company's common stock sold under the Sale Agreement as of December 31, 2023.

In December 2022, the Company completed the 2022 Offering in which the Company issued and sold 15,384,616 shares of its common stock at a price to the public of $6.50 per share. Proceeds from the offering were $94.9 million, net of underwriting discounts and commissions and offering costs of $5.1 million.

Shares of common stock subject to repurchase

During 2018, the Company issued 1,458,332 shares of restricted stock for cash at a price of $0.0001 per share. The restricted stock vests 25% one year from the vesting commencement date and monthly thereafter over a three-year period and is subject to repurchase by the Company in the event of any voluntary or involuntary termination of services to the Company prior to vesting. Any shares subject to repurchase by the Company are not deemed, for accounting purposes, to be outstanding until those shares vest. As of December 31, 2023 and 2022, no shares of common stock were subject to repurchase by the Company. The unvested stock liability related to these awards is immaterial for all periods presented. For the years ended December 31, 2023 and 2022, zero and 212,674 shares vested, respectively.

Note 10. Stock-based compensation

In July 2021, the Company's board of directors adopted and the Company's stockholders approved the Company's 2021 Incentive Award Plan (the 2021 Plan), which became effective in connection with the IPO. Upon the adoption of the 2021 Plan, the Company ceased making equity grants under its 2018 Equity Incentive Plan (the 2018 Plan). Under the 2021 Plan, the Company may grant stock options, restricted stock, restricted stock units, stock appreciation rights, and other stock or cash-based awards to individuals who are then employees, officers, directors or non-entity consultants of the Company. A total of 15,150,000 shares of common stock were initially reserved for issuance under the 2021 Plan. In addition, the number of shares of common stock available for issuance under the 2021 Plan may be increased annually on the first day of each calendar year during the term of the 2021 Plan, beginning in 2022, by an amount equal to the lesser of (i) 5% of the shares of common stock outstanding on the final day of the immediately preceding calendar year or (ii) such smaller number of shares as determined by the Company's board of directors or an authorized committee of the board of directors. As of December 31, 2023, there were 15,342,797 stock-based awards available for future grant under the 2021 Plan.

Subsequent to July 2021, no further awards will be granted under the 2018 Plan and all future stock-based awards will be granted under the 2021 Plan. To the extent outstanding options or restricted stock granted under the 2018 Plan are cancelled, forfeited, repurchased, or otherwise terminated without being exercised or becoming vested, and would otherwise have been returned to the share reserve under the 2018 Plan, the number of shares underlying such awards will be available for future grant under the 2021 Plan.

Options granted are exercisable at various dates as determined upon grant and will expire no more than ten years from their date of grant. Stock options generally vest over a four-year term. The exercise price of each option shall be determined by the Company's board of directors based on the estimated fair value of the Company's stock on the date of the option grant. The exercise price shall not be less than 100% of the fair market value of the Company's common stock at the time the option is granted. For holders of more than 10% of the Company's total combined voting power of all classes of stock, incentive stock options may not be granted at less than 110% of the fair market value of the Company's common stock on the date of grant and for a term that exceeds five years. Early exercise was permitted for certain grants under the 2018 Plan.

Stock options

A summary of the Company's stock option activity under the 2021 Plan and 2018 Plan is as follows (in thousands, except share and per share data and years):

	Shares	Weighted-average exercise price	Weighted-average remaining contractual term (years)	Aggregate intrinsic value
Outstanding at December 31, 2022	17,393,396	$ 5.84	8.20	$ 18,295
Granted	12,038,837	3.67		
Exercised	(624,807)	0.81		
Canceled	(3,836,469)	5.44		
Outstanding at December 31, 2023	24,970,957	$ 4.98	8.12	$ 4,412
Options exercisable at December 31, 2023	11,270,914	$ 4.83	7.40	$ 4,017

The weighted-average grant date fair value of options granted for the years ended December 31, 2023 and 2022 was $2.70 and $7.43, respectively. As of December 31, 2023, the unrecognized compensation cost related to unvested stock option grants was $50.4 million and is expected to be recognized as expense over approximately 2.43 years. The intrinsic value of the options exercised for the years ended December 31, 2023 and 2022 was $1.2 million and $7.8 million, respectively.

Prior to the Company's IPO, certain individuals were granted the ability to early exercise their stock options. The shares of common stock issued from the early exercise of unvested stock options are restricted and continue to vest in accordance with the original vesting schedule. The Company has the option to repurchase any unvested shares at the original purchase price upon any voluntary or involuntary termination. The shares purchased by the employees and non-employees pursuant to the early exercise of stock options are not deemed, for accounting purposes, to be outstanding until those shares vest. The cash received in exchange for exercised and unvested shares related to stock options granted is recorded as a liability for the early exercise of stock options on the accompanying consolidated balance sheets and will be transferred into common stock and additional paid-in capital as the shares vest. As of December 31, 2023 and 2022, there were 371,876 shares and 1,115,105 shares subject to repurchase by the Company, respectively. As of December 31, 2023 and 2022, the Company recorded $464,000 and $1.7 million of liabilities associated with shares issued with repurchase rights, respectively, which is recorded in accrued expenses and other current liabilities.

The assumptions used in the Black-Scholes option pricing model to determine the fair value of the employee and nonemployee stock option grants were as follows:

	Year Ended December 31,	
	2023	2022
Risk-free interest rate	3.46%-4.73%	1.46%-4.23%
Expected volatility	82.01%-85.81%	83.91%-87.11%
Expected term (in years)	5.50-6.08	5.50-6.08
Expected dividend yield	--%	--%

Employee stock purchase plan

In July 2021, the Company's board of directors adopted and the Company's stockholders approved the ESPP, which became effective in connection with the IPO. The ESPP permits participants to contribute up to a specified percentage of their eligible compensation during a series of offering periods of 24 months, each comprised of four six-month purchase periods, to purchase the Company's common stock. The purchase price of the shares will be 85% of the fair market value of the Company's common stock on the first day of trading of the applicable offering period or on the applicable purchase date, whichever is lower. A total of 1,260,000 shares of common stock was initially reserved for issuance under the ESPP. In addition, the number of shares of common stock available for issuance under the ESPP may be increased annually on the first day of each calendar year during the term of the ESPP, beginning in 2022, by an amount equal to the lesser of (i) 1% of the shares of common stock outstanding on the final day of the immediately preceding calendar year or (ii) such smaller number of shares as determined by the Company's board of directors or an authorized committee of the board of directors. The Company recognized stock-based compensation expense related to the ESPP of $1.5 million and $1.1 million during the years ended December 31, 2023 and 2022, respectively. As of December 31, 2023, the unrecognized compensation cost related to the ESPP was $1.9 million and is expected to be recognized as expense over approximately 1.94 years. As of December 31, 2023 and 2022, $46,000 and $74,000 has been withheld on behalf of employees for future purchase under the ESPP, respectively, and is included in accrued expenses and other current liabilities on the consolidated balance sheets. The Company issued and sold 388,933 and 202,882 shares under the ESPP during the years ended December 31, 2023 and 2022, respectively.

The assumptions used in the Black-Scholes option pricing model to determine the fair value of the stock to be purchased under the ESPP were as follows:

	Year Ended December 31,	
	2023	2022
Risk-free interest rate	4.43%-5.36%	2.24%-4.68%
Expected volatility	70.00%-82.79%	73.05%-87.89%
Expected term (in years)	0.49-1.99	0.50-1.99
Expected dividend yield	--%	--%

Stock-based compensation expense

The allocation of stock-based compensation for all stock awards was as follows (in thousands):

	Year Ended December 31,	
	2023	2022
Research and development	$ 13,972	$ 11,620
General and administrative	12,259	8,489
Total	$ 26,231	$ 20,109

Common stock reserved for future issuance

Common stock reserved for future issuance consisted of the following as of December 31, 2023 and 2022:

	December 31, 2023	December 31, 2022
Stock options issued and outstanding	24,970,957	17,393,396
Awards available for future grant	15,342,797	16,022,747
Shares available for purchase under the ESPP	2,080,681	965,131
Total	42,394,435	34,381,274

Note 11. Leases

Operating leases

The Company has facility leases for office space under non-cancellable and cancelable operating leases with various expiration dates through 2032 and equipment under a non-cancellable operating lease with a term expiring in 2026. Total lease costs were approximately $11.4 million and $7.7 million, including operating lease costs of $7.7 million and $5.8 million, variable lease costs of $3.7 million and $1.8 million, and short-term lease costs of $0 and $86,000 during the years ended December 31, 2023 and 2022, respectively. The Company paid $6.9 million and $1.2 million in cash for operating leases that were included in the operating activities section of the consolidated statements of cash flows for the years ended December 31, 2023 and 2022, respectively.

The weighted-average remaining lease term and the weighted-average discount rate of the Company's operating leases were 8.29 years and 8.95% at December 31, 2023, respectively. The weighted-average remaining lease term and the weighted-average discount rate of the Company's operating leases were 9.26 years and 8.96% at December 31, 2022, respectively. The weighted-average remaining lease term does not include any renewal options at the election of the Company.

The Company's lease agreements do not contain any material residual value guarantees or material restrictive covenants.

Facility leases

In September 2020, the Company entered into a lease agreement for 59,407 square feet of laboratory and office space in San Diego, California, which represented a portion of a new facility that was under construction and which was subsequently amended in March 2021 to expand the rented premises by 18,421 square feet (the 2020 Lease). The construction and design of the asset was the primary responsibility of the lessor. The Company was involved in certain aspects of construction and design for certain interior features and leasehold improvements that is beneficial to the Company to better suit its business needs and intended purpose of the space. The lease is accounted for as an operating lease and commenced in August 2021. In April 2022, the 2020 Lease was modified to amend the rent commencement date from February 2022 to May 2022. The 2020 Lease, as amended, has a term of 10.75 years and includes aggregate monthly payments to the lessor of approximately $51.6 million beginning in May 2023 with a rent escalation clause, and a tenant improvement allowance of approximately $16.8 million. The Company is responsible for its share of operating expenses based on actual operating expenses incurred by the landlord. The 2020 Lease is cancellable at the Company's request after the 84th month with 12 months written notice and a lump-sum cancellation payment of $2.5 million. The termination option has not been included in the Company's operating lease assets and liabilities. As discussed in Note 2, the Company provided a letter of credit to the lessor for $408,000, which expires July 29, 2032.

In December 2021, the Company entered into a lease agreement for 29,542 square feet of office and laboratory space in South San Francisco, California. The lease is accounted for as an operating lease with the associated operating lease assets and liabilities recorded upon commencement, which occurred in July 2022. The non-cancellable operating lease has an initial term of 124 months with an option to extend the lease term by 5 years at the then-current market rates and includes aggregate monthly payments to the lessor of approximately $34.4 million beginning in November 2022 with a rent escalation clause and a tenant improvement allowance of approximately $8.2 million. The renewal option has not been included in the Company's operating lease assets and liabilities. The Company is responsible for its share of operating expenses based on actual operating expenses incurred by the landlord. The construction and design of the tenant improvements was the primary responsibility of the lessor. While the Company was involved in certain aspects of construction and design for certain interior features and leasehold improvements that is beneficial to the Company to better suit its business needs and intended purpose of the space, all construction was handled directly by the landlord. The Company was not deemed to be the accounting owner of the tenant improvements prior to or after the construction period. All payments made by the Company for landlord-owned tenant improvements were recorded as prepaid rent on the consolidated balance sheets prior to lease commencement and included in the operating lease asset upon lease commencement. In February 2022, the expected project costs exceeded the tenant improvement allowances by $5.1 million, which was paid directly to the landlord by the Company and was recorded as prepaid rent in the consolidated balance sheets and as a cash outflow from operating activities in the consolidated statements of cash flows. Upon lease commencement, the $5.1 million of prepaid rent was included in the operating lease asset. The Company paid a security deposit of $874,000 in December 2021 that was recorded as other assets in the consolidated balance sheets.

Future minimum lease payments under the operating leases with initial lease terms in excess of one year as of December 31, 2023 are as follows (in thousands):

Year ending December 31,		
2024	$	8,752
2025		9,024
2026		9,170
2027		9,199
2028		9,277
Thereafter		35,098
Total lease payments	$	80,520
Less: Amount representing interest		(24,661)
Operating lease liabilities	$	55,859

Note 12. Commitments and contingencies

Liabilities for loss contingencies arising from claims, assessments, litigation, fines, penalties and other sources are recorded when it is probable that a liability has been incurred and the amount can be reasonably estimated. There are no matters currently outstanding for which any such liabilities have been accrued.

Note 13. Income taxes

No provision for federal, state or foreign income taxes has been recorded for the years ended December 31, 2023 and 2022.

The tax effects of temporary differences that give rise to significant portions of the deferred tax assets and deferred tax liabilities as of December 31, 2023 and 2022 were as follows (in thousands):

	December 31, 2023	December 31, 2022
Deferred tax assets:		
Net operating loss carryforwards	$ 59,326	$ 52,470
Intangible assets	25,274	36,195
Capitalized research and development costs	35,711	21,004
Operating lease liabilities	11,767	15,451
Research and development credits	14,956	9,853
Contribution of common stock	3,262	4,907
Stock-based compensation	4,007	3,961
Other, net	2,016	3,455
Total deferred tax assets	156,319	147,296
Deferred tax liabilities:		
Property and equipment	(4,511)	(5,809)
Operating lease assets	(7,975)	(11,334)
Total deferred tax liabilities	(12,486)	(17,143)
Valuation allowance	(143,833)	(130,153)
Net deferred tax assets	$ —	$ —

The Company has established a valuation allowance against net deferred tax assets due to the uncertainty that such assets will be realized. The Company periodically evaluates the recoverability of the deferred tax assets. At such time as it is determined that it is more likely than not that deferred tax assets will be realizable, the valuation allowance will be reduced. The Company has recorded a full valuation allowance of $143.8 million as of December 31, 2023, as it does not believe it is more likely than not that the deferred tax assets will be realized primarily due to the generation of pre-tax book losses, the lack of feasible tax-planning strategies, the limited existing taxable temporary differences, and the subjective nature of forecasting future taxable income into the future. The Company increased its valuation allowance by $13.7 million during the year ended December 31, 2023.

A reconciliation of the federal statutory income tax rate and the Company's effective income tax rate is as follows:

	Year ended December 31,	
	2023	2022
Federal statutory income tax rate	21.0%	21.0%
State income taxes, net of federal benefit	(9.8)	7.6
Change in valuation allowance	(11.1)	(30.3)
Other permanent differences	(1.6)	(0.3)
Research and development credits	5.0	2.9
State net operating loss	(0.4)	(0.1)
Other	(3.1)	(0.8)
Effective income tax rate	—%	—%

At December 31, 2023, the Company had federal, California, and other state net operating loss (NOL) carryforwards of $200.9 million, $243.1 million, and $2.5 million, respectively. The federal NOL carryforwards will carryforward indefinitely and can offset 80% of future taxable income each year, the California NOL carryforwards begin to expire in 2038, and the other state NOL carryforwards begin to expire in 2035.

At December 31, 2023, the Company also had federal, California, and Massachusetts research tax credit carryforwards of approximately $12.1 million, $7.1 million, and $554,000, respectively. The federal research tax credit carryforwards begin to expire in 2038, the California research tax credit carryforward does not expire and can be carried forward indefinitely until utilized, and the Massachusetts research tax credit carryforwards begin to expire in 2036.

At December 31, 2023, the Company also had federal orphan drug credit carryforwards of approximately $535,000. The federal orphan drug credit carryforwards begin to expire in 2043.

At December 31, 2023, the Company also had federal and California charitable contribution carryforwards of $15.5 million. The charitable contribution carryforwards begin to expire in 2024.

The above NOL carryforward and the research tax credit carryforwards are subject to an annual limitation under Section 382 and 383 of the Internal Revenue Code of 1986, as amended (IRC), and similar state provisions due to ownership change limitations that have occurred which will limit the amount of NOL and tax credit carryforwards that can be utilized to offset future taxable income and tax, respectively. In general, an ownership change, as defined by Section 382 and 383, results from transactions increasing ownership of certain stockholders or public groups in the stock of the corporation by more than 50 percentage points over a three-year period. The Company has not completed an IRC Section 382/383 analysis regarding the limitation of net operating loss and research and development credit carryforwards. If a change in ownership were to have occurred, additional NOL and tax credit carryforwards could be eliminated or restricted. If eliminated, the related asset would be removed from the deferred tax asset schedule with a corresponding reduction in the valuation allowance. Due to the existence of the valuation allowance, limitations created by future ownership changes, if any, related to the Company's operations in the United States will not impact the Company's effective tax rate.

The Company recognizes a tax benefit from an uncertain tax position when it is more likely than not that the position will be sustained upon examination, including resolutions of any related appeals or litigation processes, based on the technical merits. Income tax positions must meet a more likely than not recognition at the effective date to be recognized.

A reconciliation of the beginning and ending amount of unrecognized tax benefits for 2023 and 2022, excluding interest and penalties, is as follows (in thousands):

	Year ended December 31,	
	2023	2022
Balance at the beginning of the year	$ 2,725	$ 1,182
Increase related to prior year positions	99	—
Increase related to current year positions	1,272	1,543
Balance at the end of the year	$ 4,096	$ 2,725

Included in the balance of unrecognized tax benefits as of December 31, 2023 is $3.8 million that, if recognized, would reduce the Company's annual effective tax rate, subject to valuation allowance. The Company does not anticipate any significant changes to unrecognized tax benefits over the next 12 months.

The Company has filed income tax returns in Australia, the United States, California, and various other state jurisdictions. The Company is not currently under examination in any of these jurisdictions, and all of the Company's tax years remain effectively open in all jurisdictions to examination due to net operating loss carryforwards. The Company's policy is to recognize interest expense and penalties related to income tax matters as tax expense. For the years ended December 31, 2023 and 2022, the Company has not recognized any interest or penalties related to income taxes.

Note 14. Net loss per share

The following table summarizes the computation of basic and diluted net loss per share of the Company (in thousands, except share and per share data):

	Year Ended December 31,	
	2023	2022
Net loss	$ (125,042)	$ (242,805)
Weighted-average shares of common stock used in computing net loss per share, basic and diluted	150,184,994	122,024,848
Net loss per share, basic and diluted	$ (0.83)	$ (1.99)

The Company's potentially dilutive securities, which include options to purchase common stock, shares purchasable under the ESPP and common stock subject to repurchase related to options early exercised, have been excluded from the computation of diluted net loss per share as the effect would be to reduce the net loss per share. Therefore, the weighted-average number of common shares outstanding used to calculate both basic and diluted net loss per share is the same. The Company excluded the following potential common shares, presented as amounts outstanding at each period end, from the computation of diluted net loss per share for the periods indicated because including them would have had an anti-dilutive effect:

	December 31, 2023	December 31, 2022
Options to purchase common stock	24,970,957	17,393,396
Options early exercised subject to future vesting	371,876	1,115,105
Estimated shares purchasable under the ESPP	1,301,205	803,767
Total potentially dilutive shares	26,644,038	19,312,268

Note 15. Retirement plan

The Company sponsors an employee savings plan that qualifies as a deferred salary arrangement under Section 401(k) of the US Internal Revenue Code. Participating employees may defer up to the Internal Revenue Service annual contribution limit. The Company provides a safe harbor contribution of 3.0% of the employee's compensation, not to exceed eligible limits. For the years ended December 31, 2023 and 2022, the Company incurred $958,000 and $858,000 in expenses related to the safe harbor contribution, respectively.

Note 16. CARES Act

On March 27, 2020, the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) was enacted in response to the COVID-19 pandemic. The CARES Act provided for a refundable employee retention credit, which can be used to offset payroll tax liabilities. On March 11, 2021, President Biden signed the American Rescue Plan Act, which includes several provisions previously enacted under the CARES Act, such as measures that extended and expanded the employee retention credit through December 31, 2021. However, on November 15, 2021, President Biden signed into law the Infrastructure Investment and Jobs Act, which terminated the employee retention credit for wages paid in the fourth calendar quarter of 2021 for employers that are not recovery startup businesses.

Pursuant to the employee retention credit, eligible employers could receive a 50% or 70% credit on qualified wages against their employment taxes each quarter during the eligible periods in 2020 and 2021, respectively, with any excess credits eligible for refunds. During the year ended December 31, 2022, the Company recorded an employee retention credit of $2.2 million upon completion of an analysis providing reasonable assurance that the Company met the conditions set forth in the CARES Act and it was reasonably assured that the Company would receive the employee retention credit. The employee retention credit is recorded in research and development expenses and general and administrative expenses in the manner in which the qualified wages and related costs were classified.

Note 17. Related party transactions

Affini-T Therapeutics, Inc.

The Company holds a $2.0 million equity investment in Affini-T. One of the Company’s board members is also a member of the board of Affini-T.

Erasca Foundation

In May 2021, the Company established the Erasca Foundation to provide support such as funding research, patient advocacy, patient support and education in underserved populations, and funding for other initiatives to positively impact society that align with the Company’s mission. The Company's chief executive officer and certain board members serve as directors of the Erasca Foundation and the Company's chief executive officer, chief financial officer and chief business officer, and general counsel are also officers of the Erasca Foundation. In April 2023, the Company loaned the Erasca Foundation $125,000 in exchange for a non-interest bearing promissory note that matures one year following the date of the note. In December 2023, the Erasca Foundation repaid the note. As of December 31, 2023 and 2022, no amounts were recorded related to the non-interest bearing promissory note in the consolidated balance sheets.

Note 18. Subsequent events

In January 2024, the Company entered into an agreement to sublease the second floor of its corporate headquarters in San Diego, California. Pursuant to the agreement, the subleased space is approximately 10,000 square feet of office space with a sublease term of three years which includes an option for the subtenant to renew for an additional year and an early termination clause.

In January and February 2024, the Company granted options to purchase an aggregate of 9,827,650 shares of its common stock to employees and board members at a weighted-average exercise price of $1.71 per share.

EXHIBIT INDEX

Exhibit Number	Exhibit Description	Incorporated by Reference			Filed Herewith
		Form	Date	Number	
3.1	Amended and Restated Certificate of Incorporation of Erasca, Inc.	8-K	7/20/2021	3.1	
3.2	Amended and Restated Bylaws of Erasca, Inc.	8-K	7/20/2021	3.2	
4.1	Specimen stock certificate evidencing the shares of common stock	S-1	6/25/2021	4.1	
4.2	Amended and Restated Stockholders Agreement, dated April 15, 2020, by and among the Registrant and certain of its stockholders	S-1	6/25/2021	4.2	
4.3	Description of Securities	10-K	3/24/2022	4.3	
10.1#	Erasca, Inc. 2021 Incentive Award Plan and form of stock option agreement and form of restricted stock unit agreement thereunder	S-1/A	7/12/2021	10.2	
10.2#	Erasca, Inc. 2021 Employee Stock Purchase Plan	S-1/A	7/12/2021	10.3	
10.3#	Erasca, Inc. Severance and Change in Control Severance Plan and Summary Plan Description	S-1/A	7/12/2021	10.4	
10.4#	Employment Letter Agreement, dated August 18, 2020, by and between Michael D. Varney, Ph.D. and the Registrant	S-1	6/25/2021	10.9	
10.5#	Scientific Advisory Board Agreement, dated August 15, 2020, by and between Michael D. Varney, Ph.D. and the Registrant	S-1	6/25/2021	10.10	
10.6#	Amended and Restated Employment Letter Agreement, dated July 9, 2021, by and between Jonathan E. Lim, M.D. and the Registrant	S-1/A	7/12/2021	10.13	
10.7#	Amended and Restated Employment Letter Agreement, dated July 9, 2021, by and between David M. Chacko, M.D. and the Registrant	S-1/A	7/12/2021	10.14	
10.8#	Amended and Restated Employment Letter Agreement, dated April 10, 2023, by and between Shannon R. Morris, M.D., Ph.D. and the Registrant	10-Q	8/10/2023	10.1	
10.9#	Amended and Restated Employment Letter Agreement, dated July 9, 2021, by and between Ebun S. Garner and the Registrant	S-1/A	7/12/2021	10.16	
10.10#	Form of Indemnification Agreement for Directors and Officers	S-1/A	7/12/2021	10.17	
10.11†	Lease Agreement, dated September 29, 2020 by and between ARE-SD Region No. 23, LLC and the Registrant, as amended	10-Q	5/12/2022	10.2	
10.12†	License Agreement, dated February 18, 2020, by and between NiKang Therapeutics, Inc. and the Registrant	S-1	6/25/2021	10.21	
10.13†	Exclusive License Agreement, dated March 12, 2020, by and between Katmai Pharmaceuticals, Inc. and the Registrant	10-K	3/24/2022	10.16	
10.14†	Agreement and Plan of Merger, dated November 23, 2020, by and among the Registrant and its wholly-owned subsidiaries, ASN Product Development, Inc. and Asana BioSciences, LLC	S-1	6/25/2021	10.24	
10.15†	Amended and Restated License Agreement, dated November 23, 2020, by and among the Registrant's wholly-owned subsidiaries, ASN Product Development, Inc. and Asana BioSciences, LLC	S-1	6/25/2021	10.25	
10.16	Open Market Sale Agreement, dated August 11, 2022, by and between Jefferies LLC and the Registrant	S-3	8/11/2022	1.2	

10.17†	Exclusive License Agreement, dated December 9, 2022 by and between Novartis Pharma AG and the Registrant	10-K	3/23/2023	10.20	
10.18#	Erasca, Inc. Non-Employee Director Compensation Program				X
23.1	Consent of KPMG LLP, independent registered public accounting firm				X
31.1	Certification of Chief Executive Officer of Erasca, Inc., as required by Rule 13a-14(a) or Rule 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002				X
31.2	Certification of Chief Financial Officer of Erasca, Inc., as required by Rule 13a-14(a) or Rule 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002				X
32.1*	Certification of Chief Executive Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002				X
32.2*	Certification of Chief Financial Officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002				X
97	Erasca, Inc. Policy for Recovery of Erroneously Awarded Compensation				X
101.INS	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because XBRL tags are embedded within the Inline XBRL document.				X
101.SCH	Inline XBRL Taxonomy Extension Schema With Embedded Linkbase Documents				X
104	Cover Page Interactive Data File (embedded within the Inline XBRL document)				X

# Indicates management contract or compensatory plan.

† Portions of this exhibit have been omitted for confidentiality purposes.

* This certification is deemed not filed for purpose of section 18 of the Exchange Act or otherwise subject to the liability of that section, nor shall it be deemed incorporated by reference into any filing under the Securities Act or the Exchange Act.

SIGNATURES

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

Erasca, Inc.

Date: March 27, 2024

By: /s/ Jonathan E. Lim
Jonathan E. Lim, M.D.
Chairman, Chief Executive Officer and Co-Founder

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

Name	Title	Date
/s/ Jonathan E. Lim **Jonathan E. Lim, M.D.**	Chairman, Chief Executive Officer and Co-Founder (Principal Executive Officer)	March 27, 2024
/s/ David M. Chacko **David M. Chacko, M.D.**	Chief Financial Officer and Chief Business Officer (Principal Financial and Accounting Officer)	March 27, 2024
/s/ James A. Bristol **James A. Bristol, Ph.D.**	Director	March 27, 2024
/s/ Alexander W. Casdin **Alexander W. Casdin**	Director	March 27, 2024
/s/ Julie Hambleton **Julie Hambleton, M.D.**	Director	March 27, 2024
/s/ Valerie Harding-Start **Valerie Harding-Start, Ph.D.**	Director	March 27, 2024
/s/ Pratik S. Multani **Pratik S. Multani, M.D.**	Director	March 27, 2024
/s/ Jean I. Liu **Jean I. Liu, J.D.**	Director	March 27, 2024
/s/ Michael D. Varney **Michael D. Varney, Ph.D.**	Director and Chair of Research and Development	March 27, 2024

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