MERSANA THERAPEUTICS, INC.

2023 Annual Report to Stockholders

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 001-38129

Mersana Therapeutics, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**04-3562403**
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)
840 Memorial Drive Cambridge, MA	**02139**
(Address of Principal Executive Offices)	(Zip Code)

Registrant's telephone number, including area code **(617) 498-0020**

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	MRSN	The Nasdaq Global Select Market

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

NONE

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

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

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or 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 by Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

As of June 30, 2023, the last business day of the registrant's most recently completed second fiscal quarter, the aggregate market value of the registrant's common stock held by non-affiliates was $363,809,750, based on the last reported sale price of such stock on the Nasdaq Global Select Market as of such date.

As of February 23, 2024, the registrant had 121,303,007 shares of common stock, par value $0.0001 per share, outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's definitive proxy statement that will be filed for the 2024 Annual Meeting of Stockholders within 120 days of the end of the registrant's fiscal year ended December 31, 2023 are incorporated by reference in Part III of this Annual Report on Form 10-K to the extent stated herein.

TABLE OF CONTENTS

REFERENCES TO MERSANA

Throughout this Annual Report on Form 10-K, the "Company," "Mersana," "we," "us," and "our," except where the context requires otherwise, refer to Mersana Therapeutics, Inc. and its consolidated subsidiary, and "our board of directors" refers to the board of directors of Mersana Therapeutics, Inc.

SPECIAL NOTE REGARDING FORWARD LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements. Forward-looking statements are neither historical facts nor assurances of future performance. Instead, they are based on our current beliefs, expectations and assumptions regarding the future of our business, future plans and strategies, our clinical results and other future conditions. The words "aim," "anticipate," "believe," "contemplate," "continue," "could," "estimate," "expect," "goal," "intend," "may," "on track," "plan," "possible," "potential," "predict," "project," "seek," "should," "target," "will," "would" or the negative of these terms or other similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

These forward-looking statements include, among other things, statements about:

- the initiation, cost, timing, progress and results of our current and future research and development activities, preclinical studies and clinical trials, including our Phase 1 clinical trials of XMT-1660 and XMT-2056;
- the potential benefits of our existing strategic collaborations and our ability to enter into additional strategic collaborations;
- the adequacy of our inventory of XMT-1660 and XMT-2056 to support our ongoing and planned clinical trials, as well as the outcome of planned manufacturing runs;
- the adequacy of our inventory of Dolasynthen and Immunosynthen platform materials needed for the manufacture of our own product candidates and for the product candidates of our collaborators;
- the timing of, and our ability to obtain and maintain, regulatory approvals for our product candidates;
- our ability to quickly and efficiently identify and develop additional product candidates and to innovate with respect to our existing or future antibody drug conjugate platforms;
- our ability to advance any product candidate into, and successfully complete, clinical trials;
- unmet needs of patients with cancer indications;
- our intellectual property position, including with respect to our trade secrets;
- our strategic priorities; and
- our estimates regarding expenses, future revenues, capital requirements, the sufficiency of our current and expected cash resources and our need for additional financing.

We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included in this Annual Report on Form 10-K, particularly in the "Risk Factors" section, that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make.

The forward-looking statements contained herein represent our views as of the date of this Annual Report on Form 10-K and we do not assume any obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law. We anticipate that subsequent events and developments will cause our views to change. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this Annual Report on Form 10-K.

RISK FACTOR SUMMARY

Our business is subject to varying degrees of risk and uncertainty. Investors should consider the risks and uncertainties summarized below, as well as the risks and uncertainties discussed in Part I, Item 1A, *Risk Factors* of this Annual Report on Form 10-K.

Our business is subject to the following principal risks and uncertainties:

- We have a limited number of product candidates being evaluated in clinical trials. A failure of any of our current or future product candidates in clinical development could adversely affect our business and may require us to discontinue development of other product candidates based on the same platform technology.
- We will require substantial additional financing to achieve our goals, and a failure to obtain this necessary capital when needed could force us to delay, limit, reduce or terminate our product development or commercialization efforts.
- We have incurred net losses since our inception, we have no products approved for commercial sale and we anticipate that we will continue to incur substantial operating losses for the foreseeable future.
- We are in the early stages in our clinical development efforts. We have two product candidates, XMT-1660 and XMT-2056, in Phase 1 clinical development, and we have not yet completed a clinical trial for either of these product candidates.
- We have a credit facility that requires us to meet certain affirmative and negative covenants and places restrictions on our operating and financial flexibility.
- We face substantial competition, which may result in others discovering, developing or commercializing products before, or more successfully than, we do.
- Drug discovery and development is a complex, time-consuming and expensive process that is fraught with risk and a high rate of failure. We can provide no assurance of the successful and timely development of new antibody-drug conjugate, or ADC, products.
- We can provide no assurance that our product candidates will obtain regulatory approval or that the results of clinical trials will be favorable.
- If we fail to attract and retain senior management and key scientific personnel, we may be unable to successfully develop our product candidates, conduct our clinical trials and commercialize our product candidates.
- Our activities, including our interactions with healthcare providers, third party payors, patients and government officials, are, and will continue to be, subject to extensive regulation involving health care, anti-corruption, data privacy and security and consumer protection laws. Failure to comply with applicable laws could result in substantial penalties, contractual damages, reputational harm, diminished revenues and curtailment or restructuring of our operations.
- We rely upon patents and other intellectual property rights to protect our technology. We may be unable to protect our intellectual property rights, and we may be liable for infringing the intellectual property rights of others.
- Unfavorable global economic or geopolitical conditions could adversely affect our business, financial condition or results of operations.

INDUSTRY DATA

This Annual Report on Form 10-K may include industry and market data, which we may obtain from our own internal estimates and research, as well as from industry and general publications and research, surveys, and studies conducted by third parties. Industry publications, studies, and surveys generally state that they have been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. While we believe that such studies and publications are reliable, we have not independently verified market and industry data from third-party sources.

NOTE REGARDING TRADEMARKS

We own various trademark registrations and applications, and unregistered trademarks, including our name and our corporate logo. All other trade names, trademarks and service marks of other companies appearing in this report are the property of their respective holders. Solely for convenience, the trademarks and trade names in this report may be referred to without the ®,™ or © symbols, but such references should not be construed as any indicator that their respective owners will not assert, to the fullest extent under applicable law, their rights thereto. We do not intend to use or display other companies' trademarks and trade names to imply a relationship with, or endorsement or sponsorship of us by, any other companies.

PART I

ITEM 1. BUSINESS

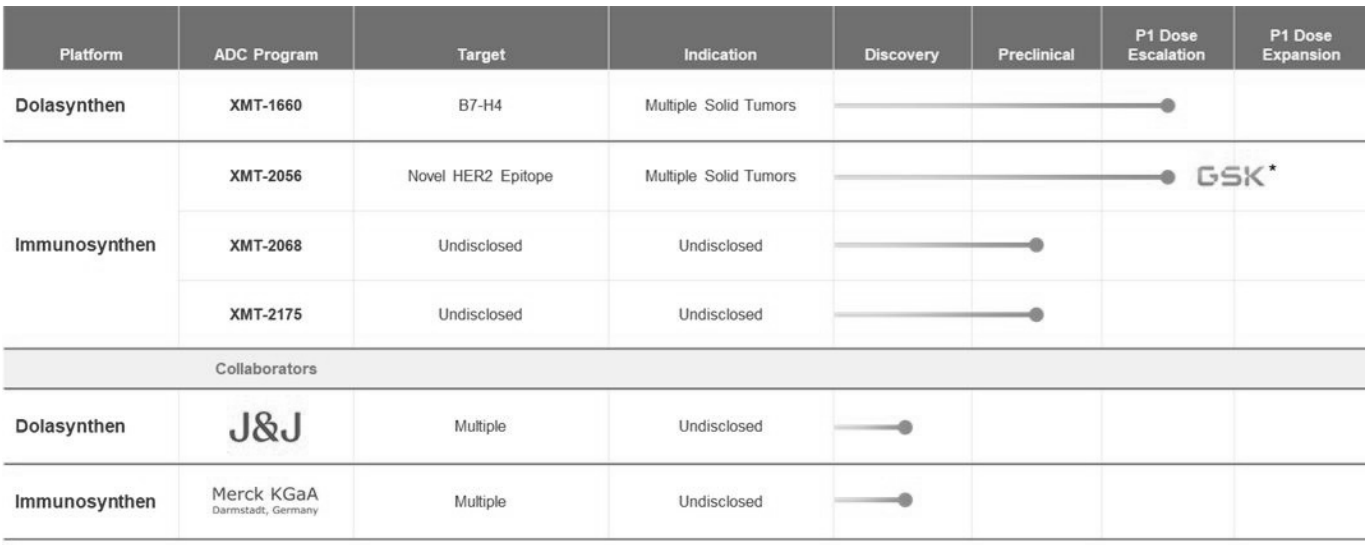
Overview

We are a clinical-stage biopharmaceutical company focused on developing antibody-drug conjugates, or ADCs, that offer a clinically meaningful benefit for cancer patients with significant unmet need. We have leveraged decades of industry learnings to develop two proprietary and differentiated ADC platforms: Dolasynthen and Immunosynthen. Dolasynthen is our cytotoxic ADC platform that is designed to generate site-specific, homogeneous ADCs. Dolasynthen allows for drug-to-antibody ratios, or DARs, to be optimized for specific targets and utilizes a proprietary auristatin payload that has been shown clinically to avoid dose-limiting severe neutropenia, peripheral neuropathy and ocular toxicity. Immunosynthen is our proprietary STING (stimulator of interferon genes)-agonist platform that is designed to generate systemically administered ADCs that locally activate STING signaling in both antigen-expressing tumor cells and in tumor-resident immune cells to unlock the anti-tumor potential of innate immune stimulation. We are utilizing these platforms to generate ADC product candidates for our company and collaborators that we believe have the potential to improve upon today's standards of care.

Our two clinical-stage product candidates are XMT-1660 and XMT-2056. XMT-1660 is a B7-H4-targeting Dolasynthen ADC designed with a precise, target-optimized DAR of 6 that we are investigating in a Phase 1 clinical trial that is currently enrolling patients with various tumors, including breast, endometrial and ovarian cancers. XMT-2056 is a systemically-administered Immunosynthen ADC targeting a novel human epidermal growth factor receptor 2, or HER2, epitope with a DAR of 8 that we are investigating in a Phase 1 clinical trial for patients with HER2-expressing advanced or recurrent solid tumors, including breast, gastric, colorectal and non-small cell lung cancers. Additionally, we have entered into strategic collaborations with Janssen Biotech, Inc., or Johnson & Johnson, and Ares Trading S.A., an affiliate of Merck KGaA, Darmstadt, Germany, or Merck KGaA, focused on the discovery, development and commercialization of additional ADC product candidates leveraging our Dolasynthen and Immunosynthen platforms, respectively. We have also granted GlaxoSmithKline Intellectual Property (No. 4) Limited, or GSK, an exclusive option for an exclusive global license to co-develop and commercialize XMT-2056.

We have assembled a management team with extensive and relevant experience, including specific ADC experience, from prior work at leading pharmaceutical companies such as Bayer AG; Centocor Inc.; Constellation Pharmaceuticals, Inc.; Cubist Pharmaceuticals, Inc.; F. Hoffmann-La Roche Ltd.; GlaxoSmithKline plc; Merck & Co.; Millennium Pharmaceuticals, Inc.; Momenta Pharmaceuticals, Inc.; Sanofi S.A.; Sunovion Pharmaceuticals Inc.; Tesaro, Inc. and Vertex Pharmaceuticals Incorporated. We are supported by a board of directors and scientific advisory board that offer complementary experience in drug discovery, development and commercialization, business development and public company management. We believe that our highly differentiated platforms, product candidates, collaborators and team position us well to discover and develop life-changing ADCs for patients fighting cancer.

Our current pipeline is summarized in the chart below:



* XMT-2056 is wholly owned by Mersana. GSK has an exclusive global license option to co-develop and commercialize the candidate
ADC, antibody-drug conjugate; HER2, human epidermal growth factor receptor 2; P1, Phase 1

Our Strategy

Although currently approved ADCs are providing substantial benefits to certain patient populations and more product candidates are in development, we believe significant platform and payload limitations are preventing this therapeutic class from realizing its full potential. We are focused on developing novel platforms and payloads that can be utilized to create ADCs with meaningfully improved safety and efficacy for patients with a range of cancers. We believe that executing against the following strategic objectives will help us achieve our goal:

- **Leverage Our ADC Platforms While Continuing to Innovate:** We believe that our two proprietary ADC platforms, Dolasynthen and Immunosynthen, can be utilized to develop impactful cytotoxic and immunostimulatory ADCs, respectively. These platforms were designed to address key limitations of ADCs today by reducing dose-limiting platform toxicities, avoiding payload resistance mechanisms and providing new payload alternatives. We believe continued platform, payload and product candidate innovation may enable us to become an ADC leader, and we have built a core team of internal research and discovery personnel that is seeking new and improved approaches to ADC design. Through these efforts, we aspire to identify and capitalize on opportunities to further differentiate our company within the field of ADCs and to maintain a robust and differentiated pipeline of product candidates.
- **Advance the Development of XMT-1660.** XMT-1660 is a B7-H4-targeting Dolasynthen ADC. We believe XMT-1660 has the potential to address unmet needs for patients with a range of cancers that express B7-H4. We continue to advance our Phase 1 clinical trial of XMT-1660 in patients with various tumors, including breast, endometrial and ovarian cancers. We are currently enrolling patients in dose escalation and backfill cohorts that are designed to assess the safety and tolerability of XMT-1660 and to optimize dose and schedule selection for further investigation in later stages of clinical development. We plan to initiate tumor-specific expansion cohorts in the trial in the second quarter of 2024 and plan to share initial dose escalation and backfill cohort data in mid-2024.
- **Advance the Development of XMT-2056.** XMT-2056 is a systemically administered Immunosynthen ADC that is designed to target a novel epitope of HER2 and to locally activate STING signaling in both tumor-resident immune cells and in antigen-expressing tumor cells in a target-dependent manner. We believe this approach may enable the treatment of patients with HER2-high or -low tumors as monotherapy and in combination with standard-of-care agents. In the fourth quarter of 2023, we announced the resolution of a U.S. Food and Drug Administration, or FDA, clinical hold on our Phase 1 clinical trial of XMT-2056 in previously treated patients with advanced or recurrent solid tumors expressing HER2. We are restarting the trial and expect to advance the dose escalation portion of the trial in 2024.
- **Collaborate with Leading Organizations.** We believe that our ADC platforms and product candidates can be leveraged by existing and future collaborators to address significant unmet needs for broad global patient populations. We have established strategic research and development collaborations with Johnson & Johnson and Merck KGaA for the research, development and commercialization of a select number of ADC product candidates leveraging our Dolasynthen and Immunosynthen platforms, respectively. We have also granted GSK an exclusive option for an exclusive global license to co-develop and commercialize XMT-2056.

ADC Background and Existing Limitations

ADCs are now a validated, well-established therapeutic modality in oncology, with 11 products currently approved for use by the FDA and well over 100 being tested in clinical trials. According to a January 2024 report from Leerink Partners, global revenues for ADC medicines reached $6.6 billion in 2022 and are expected to exceed $42 billion by 2030.

Cytotoxic oncology ADCs traditionally consist of a monoclonal antibody attached, or conjugated, to a chemotherapeutic "payload," or a cell-killing agent, via a chemical linker. The antibody provides targeting capability to a selected antigen that is over-expressed on tumor cells relative to healthy tissues, thereby providing the opportunity for preferential, targeted delivery to the tumor. Upon binding to the antigen, the ADC is internalized by the tumor cell, and the payload is released through either cleavage of the linker or degradation of the antibody. Tumor cell death results once a sufficient amount of the cytotoxic payload has been internalized by the target cell. Some ADCs utilize payloads that can freely cross cell membranes in an antigen-independent manner once they are released from the antibody, which may enhance efficacy in tumors with heterogeneous antigen expression. This phenomenon, known as “bystander effect,” may have positive impacts if it is a tumor cell that is impacted, but negative consequences if healthy cells are impacted.

Generally, ADC developers seek to identify target antigens that are highly expressed on tumor cells with very limited expression on healthy tissues in order to kill tumor cells and avoid killing healthy cells and causing "on-target" toxicity. The amount of payload delivered to the tumor cell is related to the binding of the ADC to the antigen and subsequent internalization, and, as a result, it is generally recognized that very high and consistent (or homogeneous) antigen expression throughout the tumor increases the likelihood of efficacy.

The chemical linker utilized in an ADC should provide a stable connection between the payload and the antibody in systemic circulation, as premature or uncontrolled release of the payload in systemic circulation can cause significant off-target toxicities. Upon internalization of the ADC by the targeted tumor cell, the payload typically needs to be released from the antibody, either through linker cleavage or antibody degradation, to promote rapid and efficient killing of the tumor.

Linkers used for ADCs fall into one of two categories: cleavable or non-cleavable. In general, cleavable linkers are designed to be stable in circulation and to be cleaved selectively once they reach the tumor, such as through degradation by enzymes found in the tumor. In contrast, non-cleavable linkers rely on the degradation of the antibody to release the payload. With non-cleavable linkers, the released linker-payload remains attached to a fragment of the antibody, which can limit the cell permeability and bystander effect. The solubility of the linker-payload combination employed can also have a significant influence on the properties of the resulting ADC.

Many linkers and payloads used in first-generation ADCs have very low aqueous solubility, which limits DAR to three to four due to aggregation and results in poor drug-like properties if the DAR is increased beyond this limit. In addition, the site and manner in which the linker-payload is attached to the antibody can also influence the stability and performance of the ADC, as the microenvironments surrounding each attachment site can differ and affect the properties of the linker-payload. Many first-generation ADCs leveraged a stochastic, or random, conjugation approach, which means that those platforms produce heterogeneous populations of ADCs that may include both high- and low-DAR subpopulations attached at varying attachment sites on the antibody. Such ADC heterogeneity has been shown to contribute to sub-optimal pharmacokinetics, reduced efficacy and tolerability and a narrowed therapeutic index.

More recently, ADC developers have been employing site-specific conjugation approaches designed to increase the homogeneity of ADCs. With this approach, linker-payload combinations are attached to an antibody in a precise, predefined manner rather than randomly, resulting in greater ADC homogeneity and consistency of properties.

ADC Platform Toxicity Limitations

When off-target toxicity is seen across multiple product candidates based on the same ADC platform, it can be considered antigen-independent, which we refer to as "platform toxicity." Many ADC platforms have well-established platform toxicity limitations affecting efficacy and tolerability, regardless of the antigen to which they are targeted. First-generation ADCs primarily include tubulin inhibitor payloads that interfere with the role of microtubules in cell division to kill rapidly dividing neoplastic cells while sparing normal tissues. While multiple ADCs have been approved utilizing these platforms, patients often experience severe treatment-related adverse events, or TRAEs, such as severe neutropenia, peripheral neuropathy and ocular toxicity during treatment. These types of platform-related adverse events often limit dosing and are believed to be due, at least in part, to the non-specific uptake of the payload to healthy tissue.

More recent ADC platforms have utilized topoisomerase-1, or topo-1, inhibitor payloads that inhibit the role of the topo-1 enzyme in DNA replication and transcription to kill neoplastic cells while sparing normal tissue. Patients treated with ADCs using topo-1 inhibitor payloads have reported experiencing severe TRAEs such as neutropenia, anemia, thrombocytopenia, leukopenia and interstitial lung disease, regardless of the antigen being targeted. These toxicities are believed to be associated with the role of the topo-1 enzyme in the maintenance of these normal cell types and is also believed to be independent of the antigen being targeted by these ADCs.

Because severe TRAEs, including platform toxicities, often dictate an ADC's maximum tolerated dose, we believe innovative ADCs that are able to reduce the incidence and severity of these kinds of adverse events may be more efficacious monotherapies and enable broad use in combination with other therapies.

Payload Resistance Limitations

A common mechanism of resistance to treatment in cancer is the up-regulation of multi-drug resistance, or MDR, pumps, such as P-glycoproteins, or PgPs, which can actively pump drugs out of cancer cells to help them survive. For example, MDR pumps

have been shown to confer resistance of cancer cells to ADCETRIS® (brentuximab vedotin), as well as to KADCYLA® (ado-trastuzumab emtansine), both of which are first-generation ADCs approved by the FDA for the treatment of Hodgkin's lymphoma and breast cancer, respectively.

Emerging clinical data also suggest that patients can develop resistance to ADCs with topo-1 inhibitor payloads, which are common today. This is believed to be, at least in part, the result of cancer cells upregulating the enzyme topoisomerase-2, or topo-2, which can substitute for and reduce the cell's dependence on the topo-1 enzyme. As a consequence, and as suggested by emerging clinical data, a patient's duration of clinical benefit may be greatly reduced if the patient receives another, different topo-1-based ADC after disease progression following initial treatment with a topo-1 payload ADC. Two ADCs with topo-1 payloads have been approved by the FDA to date: ENHERTU® (fam-trastuzumab deruxtecan-nxki) and TRODELVY® (sacituzumab govitecan-hziy), each of which are indicated for the treatment of breast cancer.

Lack of Proven Payload Alternatives

Each ADC currently approved for the treatment of oncology indications is equipped with cytotoxic payloads that are designed to kill cancerous cells through a direct cell-killing mechanism of action. An increasing number of companies are exploring the advantages of the ADC modality to enable the targeted delivery of other payloads, such as immunostimulatory agents and protein degraders, but no such ADCs have been approved to date.

Our ADC Platforms and Innovations

Our innovation efforts are focused on overcoming the limitations of currently approved ADCs. Specifically, we are focusing on minimizing platform toxicities, avoiding payload resistance mechanisms and providing new payload alternatives that can extend the ADC field beyond cytotoxic approaches.

We are aware that a number of diverse factors such as payload, DAR, site and method of conjugation and homogeneity all have the potential to impact the properties of an ADC. For different antibodies or target antigens, the optimal combination of these factors may differ. Unlike the "one-size-fits-all" approach used by some ADC developers, we have designed our novel and differentiated Dolasynthen and Immunosynthen platforms to allow us to optimize these properties for a given target, which we believe may enable the use of ADCs as both monotherapy and in combination with other standards of care.

We believe that a key differentiator of our ADC approach is our use of proprietary modular scaffolds that surround the payloads used in our ADCs. Our scaffolds are designed to confer precise physicochemical properties, such as charge or aqueous solubility enhancement, that can enable us to balance precisely the characteristics of our payloads to optimize pharmacokinetics, resulting in the opportunity for more efficient delivery of payload to target cells, as well as potentially expanding the therapeutic index for our ADCs. Key modules of our scaffolds have been designed to allow for site-specific conjugation, to enable precise DAR for a given target, and to adjust aqueous solubility and overall charge balance.

Our first-generation ADC platform, Dolaflexin, used an intrinsically heterogeneous natural polymer-derived scaffold to balance payload characteristics on average for high-DAR ADC applications. In developing our next generation platforms, Dolasynthen, and later Immunosynthen, we designed fully synthetic, homogenous, and precisely balanced modular scaffold approaches. Because our Dolasynthen and Immunosynthen scaffolds are modular and synthetically defined, we believe that they permit optimization against a set of design objectives. Each platform scaffold is the culmination of years of preclinical exploration of structure-activity relationships to identify both the optimal characteristics and the areas of modulation that may be fine-tuned to match with a specific target.

Dolasynthen – Our Next-Generation Cytotoxic Platform

Our Dolasynthen platform was developed both to improve upon our Dolaflexin platform and to allow us to differentiate further within the broader ADC field. Because of the nature of the scaffold used in Dolaflexin as well as its stochastic means of conjugation, Dolaflexin ADCs are inherently heterogeneous and consist of sub-populations with different properties, including those with high DAR and low DAR. Based on preclinical data, we believe that high-DAR Dolaflexin subpopulations may result in significantly reduced efficacy and increased delivery of payload to healthy tissues in comparison to lower DAR Dolaflexin subpopulations, correlating with reduced efficacy and reduced tolerability in the preclinical models studied.

We hypothesized that homogeneous ADCs, in which DAR and other important properties could be precisely controlled, could result in distinct efficacy, tolerability and therapeutic index advantages over Dolaflexin and other existing ADC platforms. This

led us to develop Dolasynthen. Dolasynthen, with its precisely defined, fully synthetic scaffold and cytotoxic payload, allows us to customize ADCs for specific targets by altering the DAR, as well as optimizing water solubility and other properties to tailor an ADC to a specific target. To ensure the homogeneity of our Dolasynthen ADCs, the Dolasynthen scaffold is bioconjugated to the antibody in a site-specific manner to create precisely defined, fully homogeneous ADCs with consistent properties. Figure 1 illustrates the homogeneity of a Dolasynthen ADC (single, sharp peak) as compared to the heterogeneity of a Dolaflexin ADC (broad peak) both created with the same antibody, as can be observed by hydrophobic interaction chromatography.

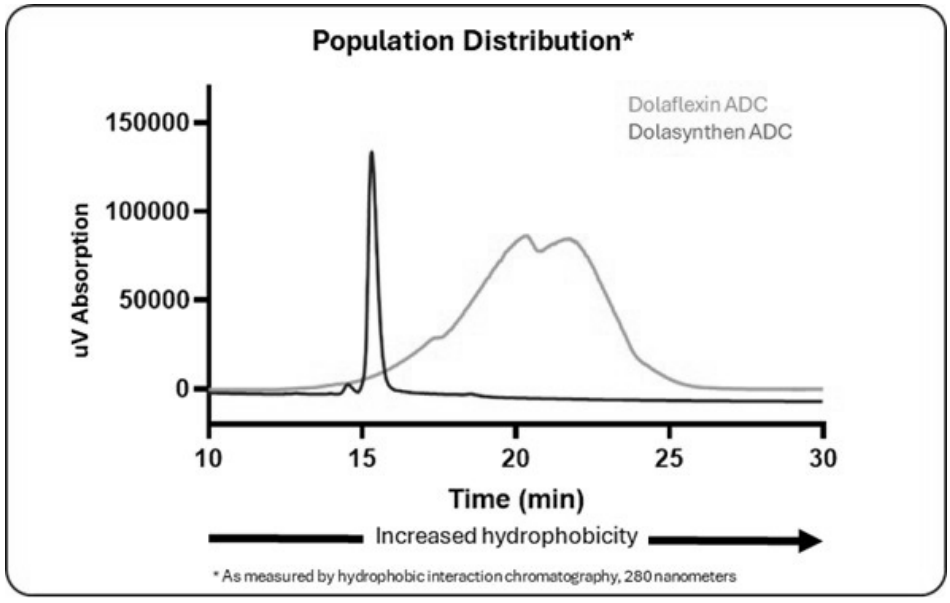


Figure 1

Dolasynthen utilizes the same proprietary auristatin anti-tubulin payload that was utilized in Dolaflexin. Our proprietary auristatin payload has been shown in *in vitro* and *in vivo* preclinical studies to control the bystander effect by locking the cytotoxic drug inside cells after allowing a short period of antigen-independent diffusion throughout the tumor. As the drug diffuses through neighboring cells, the payload is metabolized to a form that is still highly potent but is designed to no longer be able to cross the cell membrane. We believe this "controlled bystander effect" has the potential to allow for enhanced safety and efficacy. In multiple of our clinical trials of several of our earlier product candidates which trials collectively enrolled more than 600 patients, we observed that the severe neutropenia, peripheral neuropathy and ocular toxicity frequently reported in trials of ADCs based on other third-party platforms were uncommon with our auristatin anti-tubulin payload. In addition, the low permeability form of the payload is not a substrate for MDR pumps, such as Pgp, which may allow it to avoid this resistance mechanism. Finally, because our auristatin payload targets tubulin, it is not dependent on the expression of topo-1 or topo-2, which we believe may allow it to avoid topo-1 inhibitor-related resistance mechanisms.

In preclinical studies, we have observed that our payload led to immunogenic cell death and stimulated the immune system through dendritic cell activation. Consistent with this, preclinical data suggest our payload may be synergistic with immuno-oncology agents such as PD-1 inhibitors.

We have generated preclinical data comparing the properties and performance of ADCs developed using Dolasynthen, Dolaflexin and vcMMAE, a first-generation third-party platform that has been utilized to develop multiple approved ADC medicines. We believe that these data demonstrate Dolasynthen's potential for improved efficacy and pharmacokinetics relative to ADCs developed using first-generation platforms. As shown in Figure 2, in a patient-derived tumor xenograft model, we observed increased efficacy, as shown by a prolonged reduction in tumor volume following dosage with a Dolasynthen ADC in comparison to a Dolaflexin ADC, both created with the same antibody and both administered at equal payload doses.

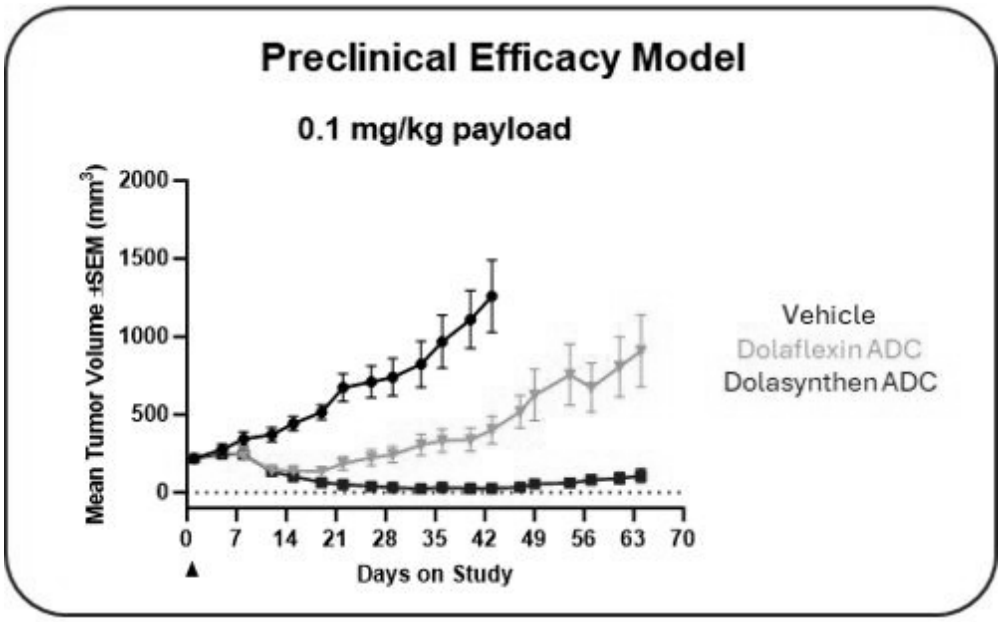


Figure 2

Additionally, as shown in Figure 3, we observed improved pharmacokinetics, including a longer half-life and greater area under the curve, for a Dolasynthen ADC, shown in blue, as compared to a vcMMAE ADC, shown in green, both created with the same antibody. In this preclinical study, each of the ADCs was dosed at an equivalent antibody dose.

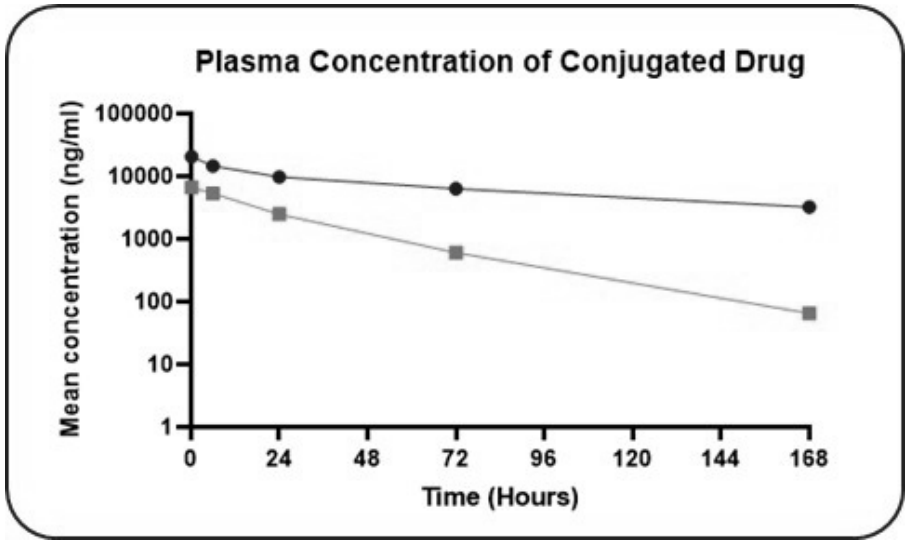


Figure 3

We also observed, as illustrated in Figure 4, that a vcMMAE ADC, shown in green, resulted in a reduction in neutrophils, or white blood cells, while the Dolasynthen ADC, shown in blue, did not experience the same reduction when tested in direct comparison in this preclinical model. This preclinical data, as it relates to dosage with the vcMMAE ADC, is consistent with clinical reports of adverse events of severe neutropenia following dosage with some vcMMAE ADCs.

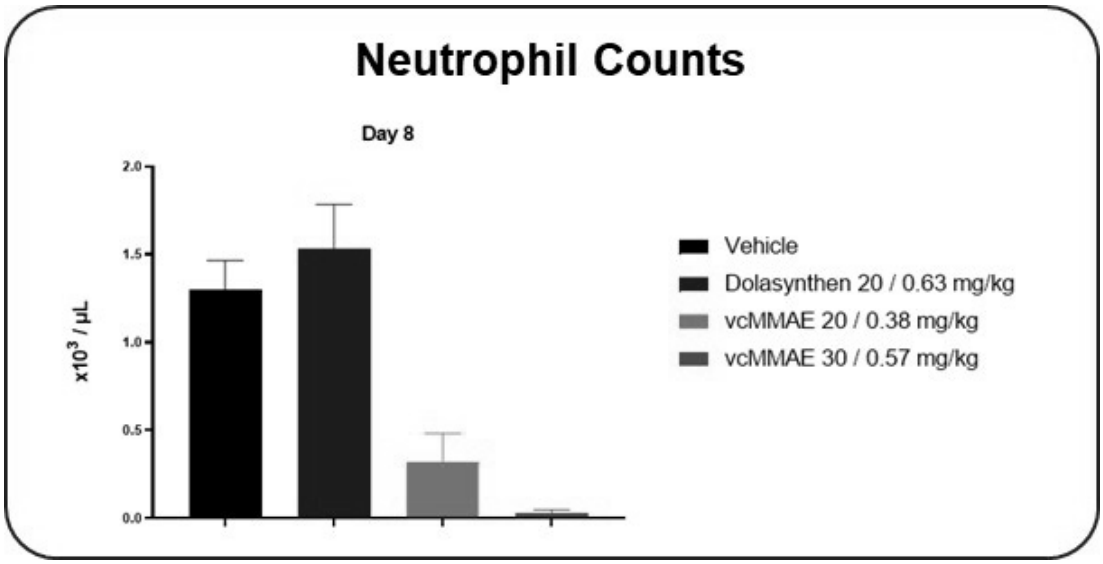


Figure 4

Finally, as shown in Figure 5, in a patient-derived tumor xenograft model, we observed that dosage with a Dolasynthen ADC resulted in greater efficacy, as measured by mean tumor volume, when compared to dosage with an equivalent payload dose of the vcMMAE ADC. Furthermore, we observed that dosage with a Dolasynthen ADC with a ten-fold lower antibody dose and four-fold lower payload dose demonstrated equivalent efficacy to dosage with the vcMMAE ADC.

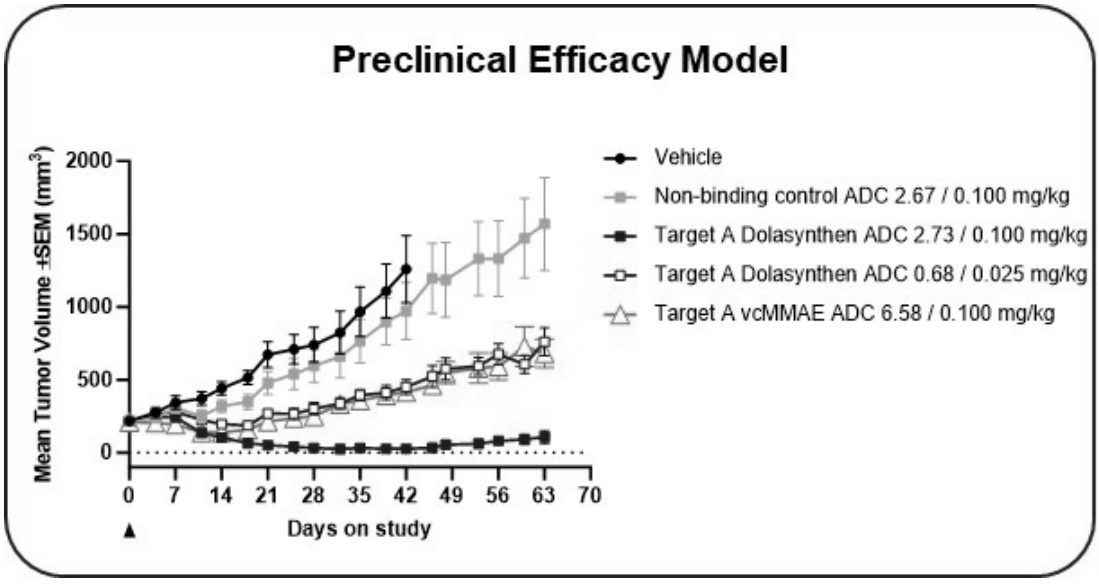


Figure 5

Our lead Dolasynthen product candidate, XMT-1660, is a B7-H4-targeting ADC that we are investigating in a Phase 1 clinical trial of patients with various tumors, including breast, endometrial and ovarian cancers. We are evaluating new targets to pursue with our Dolasynthen platform for our proprietary pipeline. Additionally, we are continuing to advance work under our collaboration and license agreement with Johnson & Johnson focused on discovering and developing novel Dolasynthen ADCs for up to three targets.

Immunosynthen – Our Immunostimulatory ADC Platform

Immunosynthen is our novel immunostimulatory ADC platform designed to take ADCs beyond the delivery of traditional cytotoxic payloads by enabling the targeted stimulation of the innate immune system.

STING agonism has been shown preclinically to have significant potential as an anti-cancer therapeutic approach. A variety of STING agonist product candidates have been investigated clinically by third parties, delivered either as systemic agents or via intratumoral injections. Systemic STING agonists have often been limited to sub-therapeutic clinical doses due to safety risks associated with systemic immune activation. Intratumoral STING-agonist injections, meanwhile, have also shown limited therapeutic impact due to the impracticality of tumor accessibility, the need for repeat invasive procedures to access the tumors and the potential for diffusion of the STING agonist outside of the tumor.

We believe ADCs created with our Immunosynthen platform, which targets the delivery of a novel STING agonist payload via an antibody, have the potential to address the challenges of delivery, efficacy and tolerability posed by systemic or intratumoral injections of free (unconjugated) STING agonists.

The proprietary STING agonist payload we use in our Immunosynthen platform was designed to have very low cell permeability to control the delivery and localization of its innate immune-activating effect. Our preclinical data show that the anti-tumor activity of Immunosynthen ADCs is driven by the antigen-dependent delivery and subsequent activation of the STING pathway in both tumor-resident immune cells and in tumor cells. STING pathway activation in both cell types provides the potential for enhanced anti-tumor activity compared to other innate immune approaches, such as toll-like receptor, or TLR, agonists, that have been shown to activate only immune cells and not in tumor cells.

We are restarting a Phase 1 clinical trial of XMT-2056, our lead Immunosynthen ADC, which targets a novel epitope of HER2, following the lifting in the fourth quarter of 2023 of a clinical hold placed on this trial by the FDA. We also are evaluating new targets to pursue with Immunosynthen in our proprietary pipeline. Additionally, we are continuing to advance work under our collaboration and license agreement with Merck KGaA focused on discovering novel Immunosynthen ADCs for up to two targets.

Our Product Candidates

We are leveraging our platforms to develop a robust pipeline of product candidates that have the potential to become clinically meaningful cancer therapies. Our pipeline strategy focuses on targets that have been biologically validated (either through ADCs or other modalities), where the advantages of our platforms may lead to clinically superior therapeutic benefits and where we have the potential to achieve first-in-class or best-in-class status by pursuing competitive and fast-to-market development strategies.

We are advancing XMT-1660, our lead Dolasynthen ADC, and XMT-2056, our lead Immunosynthen ADC, in Phase 1 clinical trials. We also have two earlier stage preclinical candidates, which we refer to as XMT-2068 and XMT-2175, that leverage our Immunosynthen platform. In addition, our collaborators have multiple ADC product candidates in various stages of development.

XMT-1660: Our Lead Dolasynthen ADC Candidate

XMT-1660 is a B7-H4-targeted Dolasynthen ADC with a precise, target-optimized DAR of 6 that we are investigating in a Phase 1 clinical trial enrolling patients with various tumors, including breast, endometrial and ovarian cancers. B7-H4 is a member of the CD28/B7 family of cell surface proteins that promotes tumorigenesis by suppressing anti-tumor immunity and serves as a negative prognostic indicator for multiple tumor types. Its expression in normal human tissue is generally reported to be limited, but it is highly expressed on multiple tumor types with high unmet need, including breast, endometrial and ovarian cancers.

Additionally, B7-H4 expression in tumors has minimal overlap with programmed death-ligand 1, or PD-L1 (also known as B7-H1), expression, which may reflect functional redundancy in inhibiting antitumor immunity. Consequently, in B7-H4-positive, or B7-H4+, tumors where PD-L1 expression is absent or low and PD-(L)1 immune checkpoint inhibitors may not be effective, a B7-H4-targeted agent may be an effective treatment option. The non-overlapping expression profiles also may provide a rationale for the potential benefit of combining B7-H4 and PD-(L)1 targeted therapies to prevent tumors from escaping therapy by switching between these immunosuppressive proteins.

We generated favorable preclinical efficacy and tolerability data with Dolasynthen ADCs targeting B7-H4 with precise DARs of 2 and 6 and compared these against a B7-H4 Dolaflexin ADC with a DAR of approximately 12. We selected the DAR6 variant for XMT-1660 based on these preclinical data. We believe that targeting B7-H4 with XMT-1660 provides significant opportunities for development in areas of high unmet need.

We are conducting a Phase 1 open-label clinical trial of XMT-1660 in patients with various tumors, including breast, endometrial, and ovarian cancers. The primary endpoints for the dose-escalation portion of the trial are to determine the maximum-tolerated dose and to evaluate the safety and tolerability of treatment with XMT-1660. We are currently enrolling patients in dose escalation cohorts and have escalated to a dose of 59 mg/m2. We have not established a maximum tolerated dose as of the date of this Annual Report on Form 10-K. In addition to continuing to escalate dosing, we are also enrolling patients in backfill cohorts to optimize dose and schedule for further investigation in later stages of clinical development. Due to the unmet medical need of breast cancer patients who were previously treated with topo-1 ADCs like trastuzumab deruxtecan and sacituzumab govitecan, and the emerging clinical data about topo-1 resistance, we are enrolling these patients in our ongoing Phase 1 clinical trial. We plan to initiate tumor-specific expansion cohorts in the trial in the second quarter of 2024 and plan to share initial dose escalation and backfill cohort data in mid-2024.

B7-H4-Expressing Cancers of Immediate Interest

While a variety of cancers express B7-H4, triple-negative breast cancer, or TNBC; estrogen-receptor/hormone-receptor positive breast cancer, or ER+/HR+BC; endometrial cancer; and ovarian cancer are among those reported to most frequently overexpress this antigen. We are enrolling patients in these indications in our Phase 1 clinical trial of XMT-1660.

- **TNBC:** According to the U.S. National Cancer Institute, or NCI, there were approximately 297,790 new cases of breast cancer and 43,170 related deaths in the United States in 2023. TNBC accounts for approximately 12% of breast cancer cases. Treatment is characterized by single-agent chemotherapy followed by topo-1 inhibitor ADCs. Immunotherapy and PARP inhibitors may also play a role for a subset of these patients. XMT-1660 was designated a Fast Track product by the FDA for the treatment of adult patients with advanced or metastatic TNBC who have received at least one prior line of chemotherapy in the metastatic setting.
- **ER+/HR+BC:** Of the 297,790 new cases of breast cancer in the United States, ER+/HR+BC is the most prevalent subtype, representing approximately 73% of cases according to the American Cancer Society. The primary treatment option for patients who are HR+ is endocrine therapy, including aromatase inhibitors. Other targeted agents used in this setting include CDK4/6 inhibitors, PI3K inhibitors, and more recently, topo-1 inhibitor ADCs.
- **Ovarian Cancer:** According to NCI, there were approximately 19,710 new cases of ovarian cancer and 13,270 related deaths in the United States in 2023, making this the most common cause of gynecologic cancer death in the United States. Standard-of-care treatment consists of repeated lines of platinum-containing chemotherapy followed by observation or maintenance with either PARP inhibitors or bevacizumab until the patient becomes resistant to platinum chemotherapy. These patients are then eligible for single-agent non-platinum chemotherapy or, if they are determined to have high folate receptor alpha expression, the anti-tubulin ADC mirvetuximab soravtansine.
- **Endometrial Cancer:** According to NCI, there were approximately 66,200 new cases of endometrial/uterine cancer and 13,030 related deaths in the United States in 2023, making this the country's most common gynecological malignancy. Surgery followed by systemic therapy is the mainstay of treatment for advanced endometrial cancer, with systemic therapy guided by microsatellite instability/mismatch repair deficient, or MSI/dMMR, status. Immunotherapy in combination with chemotherapy or tyrosine kinase inhibitors is standard of care with limited subsequent treatment options.

We believe there remains significant unmet need for novel treatment options such as XMT-1660, particularly in the recurrent setting, given the high rate of relapse in all of these cancer types and emerging evidence of resistance to treatment with topo-1 inhibitor ADCs.

XMT-2056: Our Lead Immunosynthen ADC Candidate

XMT-2056 is a systemically administered Immunosynthen STING agonist ADC (DAR 8) that is designed to target a novel epitope of HER2 distinct from that targeted by either trastuzumab or pertuzumab, and to locally activate STING signaling in both tumor-resident immune cells and in tumor cells, providing the potential to treat patients with HER2-high or -low tumors as monotherapy and in combination with standard-of-care agents.

HER2 belongs to a family of signaling molecules that are highly and preferentially expressed on the surface of various cancer cells and are known to play a role in promoting tumor cell growth. HER2 protein overexpression is well documented across multiple cancers, including breast, gastric, bladder, lung, esophageal, colorectal, endometrial, ovarian, salivary gland, pancreatic, cervical, and other cancers, although the prevalence of HER2-overexpression varies across indications.

In preclinical studies, we observed that XMT-2056 demonstrated anti-tumor activity driven by the targeted activation of the STING pathway in tumor-resident immune cells and in tumor cells, in a HER2-dependent manner. We also observed that in a preclinical setting, XMT-2056 enhanced anti-tumor activity when dosed in combination with approved agents such as anti-PD-1 antibodies or trastuzumab deruxtecan.

We initiated a multicenter Phase 1 open-label trial of XMT-2056 in previously treated patients with advanced/recurrent solid tumors expressing HER2, including breast, gastric, colorectal and non-small cell lung cancers, in January 2023. The trial is designed to determine the maximally tolerated dose or the recommended phase 2 dose and to assess the safety and tolerability of treatment with XMT-2056. The trial design includes select enrichment cohorts that will evaluate treatment in tumor type-specific cohorts at cleared dose levels from the dose escalation cohort. We expect that select enrichment cohorts will include two breast cancer enrichment cohorts in HER2+ and HER2-low breast cancer. We plan to utilize data from both the dose escalation and the select enrichment cohorts to determine the recommend phase 2 dose.

In March 2023, we announced that this Phase 1 trial of XMT-2056 had been placed on clinical hold by the FDA following our communication to the FDA that we were voluntarily suspending the trial due to a Grade 5 (fatal) serious adverse event, or SAE, that was deemed to be related to XMT-2056. The SAE occurred in the second patient who had been enrolled at the initial dose level in the dose escalation portion of the Phase 1 trial. We reviewed the cytokine and other clinical data from the first two patients dosed in this trial and noted markers of immune activation that indicate XMT-2056 is a more potent innate immune stimulator in humans than we had previously observed in preclinical studies.

On October 31, 2023, we announced that the FDA had lifted the clinical hold on our Phase 1 clinical trial of XMT-2056. We have lowered the starting dose in our Phase 1 dose escalation design and are restarting this trial. We plan to advance dose escalation in this Phase 1 trial in 2024.

HER2-Expressing Cancers of Immediate Interest

While a variety of cancers express HER2, we plan to enroll patients with various tumors, including breast cancer, gastric cancer, colorectal cancer and non-small-cell lung cancer, or NSCLC, in our Phase 1 clinical trial of XMT-2056.

- **Breast Cancer:** Of the 297,790 new cases of breast cancer in the United States, approximately 15-20% of these tumors are believed to be HER2+ according to NCI. These patients are usually treated with HER2-targeting agents such as trastuzumab and pertuzumab, among others. Trastuzumab deruxtecan, a topo-1 inhibitor ADC, has recently become the standard of care treatment in the recurrent metastatic HER2+ setting and is increasingly being utilized in earlier lines of treatment.
- **Gastric Cancer:** According to NCI, there were approximately 26,500 new U.S. cases of gastric (stomach) cancer and 11,130 related deaths in 2023, and 15-20% of these tumors are believed to be HER2+. Gastrectomy surgery, chemotherapy and radiation are the primary treatments for initial disease. Immunotherapy and/or HER2-targeting agents such as trastuzumab, pertuzumab or trastuzumab deruxtecan may also be utilized. XMT-2056 was granted orphan drug designation by the FDA for the treatment of gastric cancer in 2022.
- **Colorectal Cancer:** According to NCI, there were approximately 153,020 new U.S. cases of colorectal cancer and 52,550 related deaths in 2023, and 5% of these tumors are believed to be HER2+. Colorectal surgery, chemotherapy and radiation are the primary treatments for initial disease. Immunotherapy and/or HER2-targeting agents such as trastuzumab or pertuzumab may also be utilized.
- **NSCLC:** According to NCI, there were approximately 238,340 new U.S. cases of lung cancer and 127,070 related deaths in 2023, with an estimated 80-85% of these cases being considered non-small cell lung cancer, or NSCLC, and 15-20% of these tumors believed to be HER2+. Lung resection surgery, chemotherapy and immunotherapy are the primary treatments for initial disease. Radiation therapy and certain targeted therapies, including trastuzumab, pertuzumab or trastuzumab deruxtecan, are utilized in later lines and later stages of disease.

We believe there remains significant unmet need for novel treatment options such as XMT-2056, particularly in the recurrent setting, given the high rate of relapse in all of these cancer types and emerging evidence of topo-1 inhibitor ADC resistance mechanisms.

Discontinued Product Candidates

In July 2023, we discontinued the development of XMT-1536, otherwise known as upifitimab rilsodotin, or UpRi, which was an ADC targeting the sodium-dependent phosphate transport protein NaPi2b that we developed utilizing our first-generation Dolaflexin platform. This decision followed topline data from UPLIFT, a single-arm clinical trial that enrolled platinum-resistant ovarian cancer patients with one to four prior treatment regimens. With an investigator-assessed 15.6% objective response rate, or ORR, in the NaPi2b positive population, this trial did not meet its primary endpoint to exclude the lower bound of the 95% confidence interval for a 12% ORR seen with standard-of-care single-agent chemotherapy. The investigator-assessed duration of response in the NaPi2b positive population was 7.4 months. In UPLIFT, the most common treatment related adverse events included transient AST elevation, nausea, platelet count decrease (including thrombocytopenia), and fatigue. Grade 3 peripheral neuropathy and neutropenia occurred in less than 1% of patients with no Grade 3 or greater ocular toxicity reported. Pneumonitis occurred in 9.7% of patients, which we hypothesize is on-target toxicity due to NaPi2b expression in type II pneumocytes in the lung. Treatment emergent Grade 3 or greater adverse events of hemorrhage occurred in 5.6% of patients, including 5 fatal cases. Following in-depth analyses of all of our UpRi and XMT-1592 clinical data (XMT-1592 discussed below) and our preclinical data on programs using the same antibody and payload with different scaffolds and platforms, we hypothesize that the severe bleeding risk was driven by endothelial damage resulting from non-specific delivery of high-DAR sub-populations in the heterogeneous Dolaflexin mixture of UpRi. Platelet count decreases were observed in the majority of patients. We hypothesize that this decrease in platelets was a marker of platelet consumption and activation, and a potential indicator of this endothelial damage.

In May 2022, we also discontinued the development of XMT-1592, a Dolasynthen ADC targeting NaPi2b with the same payload utilized in UpRi. XMT-1592 had been investigated in a Phase 1 dose escalation trial in patients with ovarian cancer and NSCLC. We discontinued this trial after enrolling 31 patients in dose escalation, and observed an overall objective response rate of 31% in evaluable ovarian cancer patients (n=13) at the two highest dose levels regardless of selection for NaPi2b expression. Additionally, based on our understanding of the platform toxicities observed with UpRi the data from this discontinued Phase 1 trial suggests that off-target toxicity with XMT-1592 was reduced relative to UpRi. Fatigue, nausea, and transient AST elevation occurred at a lower frequency and severity with XMT-1592 compared to UpRi. Additionally, no treatment-related adverse events of platelet count reductions (including thrombocytopenia) or bleeding events were reported with XMT-1592. As was the case in UPLIFT, pneumonitis was reported in this Phase 1 trial of XMT-1592. We hypothesize that this toxicity is an on-target toxicity related to NaPi2b expression in type II pneumocytes in the lung.

We plan to disclose clinical data from both UPLIFT and the XMT-1592 Phase 1 trial at the European Society of Gynaecological Oncology, or ESGO, 2024 Congress in March 2024.

Strategic Collaborations

We view business development as a core pillar of our overall corporate strategy, and our platforms and product candidates allow us to consider multiple types of potential strategic collaborations. We believe that our ADC platforms have broad applicability across a number of targets, allowing us to consider collaborations in which a partner provides proprietary antibodies for a select number of targets and we utilize our platforms to discover novel ADC product candidates. Under these collaboration agreements, we own the rights to any improvements to our ADC platform(s). For example, we have entered into a Dolasynthen-focused discovery collaboration with Johnson & Johnson and an Immunosynthen-focused discovery collaboration with Merck KGaA. We believe platform-based collaborations allow us to leverage the potential of our platforms, provide near-term capital and help us potentially bring important new therapeutic options to patients.

We also have internally developed ADC product candidates that allow us to consider arrangements in which a collaborator may assume certain preclinical, clinical and/or commercial responsibilities. For example, we have granted GSK an exclusive option for an exclusive global license to co-develop and commercialize XMT-2056. GSK has not exercised this option to date. We believe product-focused collaborations could provide near-term funding, allow us to advance and broaden preclinical, clinical or commercial development efforts beyond those we could independently, and potentially bring new therapeutic options to patients.

2022 Merck KGaA Collaboration

In December 2022, we entered into a collaboration and commercial license agreement, or the 2022 Merck KGaA Agreement, with Merck KGaA. Pursuant to the 2022 Merck KGaA Agreement, we will grant Merck KGaA an exclusive license to use our proprietary technology to develop, manufacture and commercialize Immunosynthen ADCs directed to up to two specific target antigens, or the Designated Targets, selected by Merck KGaA within a certain period following the effectiveness of the 2022 Merck KGaA Agreement. Merck KGaA has already selected the first Designated Target under the 2022 Merck KGaA Agreement.

Under the terms of the 2022 Merck KGaA Agreement, the parties will conduct up to two research programs. Each research program will involve activities related to Immunosynthen ADCs for a selected Target (with each such ADC developed under the 2022 Merck KGaA Agreement being a Licensed ADC) until the submission of an investigational new drug application, or IND, (or foreign equivalents) for a Licensed ADC directed at such Designated Target, or each a Merck KGaA Licensed Product, or until the earlier expiration of the defined research period. Each research program will follow a research plan agreed between the parties. For each Designated Target, Merck KGaA is responsible for providing up to a specified number of antibodies against such Designated Target, and we are responsible for conjugating such antibodies using our Immunosynthen platform to create Licensed ADCs. Each party will be responsible for their own costs under the research programs. In addition, we will be responsible for certain chemistry, manufacturing and controls development and certain manufacturing activities for the Licensed ADCs, up to and including manufacturing of drug substance for Licensed ADCs to be used in certain preclinical studies and clinical trials, in each case at Merck KGaA's expense, some of which will be prepaid by Merck KGaA. Except as provided above, Merck KGaA is solely responsible for *in vitro* and *in vivo* characterization of any Licensed ADCs, other preclinical work, and all clinical development and potential commercialization activities relating to any resulting Merck KGaA Licensed Products.

Under the terms of the 2022 Merck KGaA Agreement, we received an upfront payment of $30.0 million in February 2023. Certain development and regulatory milestones will be payable by Merck KGaA to us for the research programs, including upon certain discovery milestones, initiation of certain clinical trials, and regulatory approval of Merck KGaA Licensed Products in certain geographies, with an aggregate total of up to $200 million in the event Merck KGaA advances Merck KGaA Licensed Products directed to both Designated Targets to regulatory approval.

In the event the commercialization of the Merck KGaA Licensed Product results in commercial sales, commercial milestones will be payable by Merck KGaA to us for each program upon the achievement of specified aggregate sales thresholds for an Merck KGaA Licensed Product for the applicable Designated Target, with an aggregate total of up to $600 million in the event Merck KGaA Licensed Products directed to both Designated Targets are commercialized by Merck KGaA. In addition, we are eligible to receive tiered royalties at percentages ranging from the single digits to the low double digits on future net sales of Merck KGaA Licensed Products.

Merck KGaA's royalty obligations continue with respect to each country and each Merck KGaA Licensed Product until the latest of (i) the date on which such Merck KGaA Licensed Product is no longer covered by certain intellectual property rights in such country, (ii) the 10th anniversary of the first commercial sale of such Merck KGaA Licensed Product in such country and (iii) the expiration of marketing or data exclusivity for such Merck KGaA Licensed Product in such country.

Under the terms of the 2022 Merck KGaA Agreement, subject to certain exceptions and for an agreed period of time, we will not, either ourselves or through third parties, research, develop, manufacture or commercialize other ADCs utilizing our Immunosynthen platform that are directed to the Designated Targets. We and Merck KGaA will form a joint research committee, joint manufacturing committee, and joint intellectual property committee responsible for coordinating activities pursuant to the 2022 Merck KGaA Agreement.

Each party has the right to sublicense its rights under the 2022 Merck KGaA Agreement subject to certain conditions. The 2022 Merck KGaA Agreement will continue, unless earlier terminated, until the expiration of the last-to-expire royalty term for the last Merck KGaA Licensed Product or, if Merck KGaA does not advance any Merck KGaA Licensed Products, upon the expiration of the last-to-expire research program. Merck KGaA may, at its convenience, terminate the 2022 Merck KGaA Agreement in its entirety or on a Designated Target-by-Designated Target basis upon certain notice to us. Either we or Merck KGaA may terminate the 2022 Merck KGaA Agreement for the other party's insolvency or certain uncured breaches. In lieu of terminating the 2022 Merck KGaA Agreement, in the event Merck KGaA is entitled to terminate the 2022 Merck KGaA Agreement due to our uncured material breach, Merck KGaA may make an election, as its sole and exclusive remedy with respect to our applicable material breach of the 2022 Merck KGaA Agreement, to invoke a specified financial penalty impacting one or more future payments that may become payable to us following such uncured material breach. We may terminate the 2022 Merck KGaA Agreement with respect to a Designated Target in the event of certain failures by Merck KGaA to progress the corresponding research program. Additionally, we may terminate the 2022 Merck KGaA Agreement if Merck KGaA or any of its sublicensees or affiliates challenge, subject to certain exceptions, the validity, enforceability, of patentability of certain of our patents.

GSK Collaboration

In August 2022, we entered into a collaboration, option and license agreement with GSK, or the GSK Agreement, to provide GSK with an exclusive option to obtain an exclusive global license to co-develop and to commercialize products containing XMT-2056, or Licensed Products, exercisable within a specified time period, or the Option Period, after we deliver to GSK a data package, or the Option Data Package, resulting from completion of dose escalation with enrichment for breast cancer patients in a Phase 1 single-agent clinical trial of XMT-2056. GSK's exercise of the Option may require clearance under the Hart-Scott-Rodino Antitrust Improvements Act of 1976, or HSR Clearance. Upon GSK's exercise of the Option following any applicable HSR Clearance, or the GSK Option Exercise, GSK is obligated to pay us an option exercise payment of $90.0 million.

We will lead research and development activities related to our XMT-2056 program prior to the GSK Option Exercise, if any, and we are obligated to use commercially reasonable efforts to generate the Option Data Package by an agreed time. Prior to the GSK Option Exercise, we will be responsible for the costs of manufacturing, research and early clinical development activities related to the XMT-2056 program.

Following the GSK Option Exercise, if any, GSK may elect to manufacture XMT-2056, and we and GSK will co-develop XMT-2056 in accordance with a joint development plan to be established by the parties and aimed at approval of Licensed Products in the United States and the European Union, with GSK being responsible for the majority of the development activities and costs. GSK will be responsible for all of the development costs aimed solely at gaining approval outside the United States and the European Union. Subject to certain exceptions set forth in the GSK Agreement, our aggregate share of U.S.- and E.U.-focused development costs pursuant to this cost-sharing arrangement is capped at a fixed amount, or the Mersana Development Cost Cap. We may also, subject to certain limitations provided in the GSK Agreement, elect to opt out of sharing in development costs for certain later-stage clinical trials of Licensed Products requested by GSK, subject to certain payment obligations in the event that data from any such later-stage clinical trial for which we have opted out of sharing in development costs results in certain marketing approvals for a Licensed Product in the United States or European Union, or a Deemed Buy-In Payment. Any development costs in excess of the Mersana Development Cost Cap, including any amounts arising from any Deemed Buy-In Payments, will be borne by GSK unless and until we exercise our Profit Share Election (as defined below). Development costs in excess of the Mersana Development Cost Cap will accrue interest at a variable rate equal to the prime rate plus a specified margin and will later either be repaid by us or offset against future regulatory and sales milestone or royalty payments that may become due to us. If we exercise our Profit Share Election, the Mersana Development Cost Cap will no longer apply, we must pay any then-outstanding excess plus accrued interest, and we shall continue to share in further U.S.- and E.U.-focused development costs.

Following the GSK Option Exercise, if any, we will have the option, during a specified time period following our receipt of certain later-stage clinical data and other data and information from GSK, to elect to receive (or bear) a specified share of U.S. profits (or losses) for any Licensed Products, or the Profit Share Election. Additionally, if we exercise our Profit Share Election, we may also simultaneously elect to co-promote any Licensed Products in the United States. The co-promotion arrangement may be terminated by either party, notwithstanding the continued effectiveness of the rest of the GSK Agreement, in the event of certain breaches by the other party, or by GSK, in the event of certain specified changes of control of Mersana. In addition, in the event of certain specified changes of control of Mersana, GSK can prohibit us from executing development activities that are initiated under the GSK Agreement following such change of control.

We received an upfront payment of $100 million from GSK for the Option. We are eligible to receive up to $30 million upon satisfaction of early clinical development milestones that may occur prior to the GSK Option Exercise. Subject to the GSK Option Exercise, if we do not exercise our Profit Share Election, we will be eligible to receive additional future clinical development and regulatory milestone payments of up to $592 million, commercial milestone payments of up to $652 million and tiered double-digit royalties up to the mid-twenty percent range on global sales of Licensed Products, if approved, subject to customary reductions. If we exercise our Profit Share Election, we will, in lieu of the foregoing regulatory and commercial milestone amounts, be eligible to receive reduced regulatory and commercial milestone payments and reduced royalty rates on sales outside of the United States. Additionally, whether or not we exercise our Profit Share Election, GSK will be responsible for certain milestone payments or royalties due to specified third parties with which we currently have agreements that relate to the XMT-2056 program.

GSK's royalty obligations continue with respect to each country and each Licensed Product until the latest of (i) the date on which such Licensed Product is no longer covered by certain intellectual property rights in such country, (ii) the 12th anniversary of the first commercial sale of such Licensed Product in such country and (iii) the expiration of regulatory exclusivity for such Licensed Product in such country.

Under the terms of the GSK Agreement, subject to certain exceptions and for an agreed period of time, we and GSK will not, either directly or through third parties, develop or commercialize other products or compounds that (a) comprise or contain an ADC that is conjugated with a STING agonist and (b) are directed to HER2. In addition, we have granted GSK a right of first negotiation for future ADCs that are conjugated to payloads other than STING agonists and directed to HER2. Following the GSK Option Exercise, if any, we and GSK will form a joint steering committee, joint development committee, joint manufacturing committee, joint commercialization committee, and financial working group responsible for coordinating all activities under the GSK Agreement, with GSK having final decision-making authority over most issues, subject to certain enumerated exceptions.

The GSK Agreement will terminate at the end of the Option Period if GSK does not exercise its Option. If GSK exercises its Option but we do not obtain HSR Clearance within specified time periods following the latest date on which the parties have made their respective applicable filings related to such HSR Clearance, each party has a right to terminate the GSK Agreement. In the event of the GSK Option Exercise, the GSK Agreement will continue in effect on a Licensed Product-by-Licensed Product and country-by-country basis until the expiration of the obligation to make payments under the GSK Agreement with respect to such Licensed Product in such country, unless earlier terminated by either party pursuant to the terms of the GSK Agreement. Either we or GSK may terminate the GSK Agreement for the other party's insolvency, and each party may terminate the GSK Agreement for certain uncured breaches by the other party. In lieu of terminating the GSK Agreement, in the event of certain uncured material breaches by us, GSK may make a one-time election, in addition to other contractual remedies available at law or in equity, to invoke a specified financial penalty impacting one or more future payments that may become payable to the Company following such uncured material breach. We may terminate GSK's license to certain of our patents if GSK or any of its sublicensees or affiliates challenge the validity, enforceability, of patentability of such patents. GSK may terminate the GSK Agreement for convenience upon certain notice to us.

Johnson & Johnson Collaboration

In February 2022, we entered into a research collaboration and license agreement with Johnson & Johnson. We refer to this agreement, as amended on July 14, 2023 and September 25, 2023, as the Johnson & Johnson Agreement. Pursuant to the Johnson & Johnson Agreement, we granted Johnson & Johnson an exclusive license to use our proprietary Dolasynthen platform and other technology to develop, manufacture and commercialize antibody-drug conjugates directed to up to three targets selected by Johnson & Johnson. Our responsibilities are to perform bioconjugation activities to create ADCs for Johnson & Johnson based on antibodies provided by Johnson & Johnson. We will also perform certain chemistry, manufacturing and controls development and early stage manufacturing activities for ADCs that Johnson & Johnson progresses through development, up to and including the manufacturing of clinical drug substance, at Johnson & Johnson's cost. Except with respect to this limited manufacturing, Johnson & Johnson will be responsible for the further development, manufacturing and commercialization of the ADCs developed under the Johnson & Johnson Agreement, including obtaining any necessary regulatory approvals, at Johnson & Johnson's cost.

Under the terms of the Johnson & Johnson Agreement, we received an upfront payment of $40 million. Certain development and regulatory milestones will also be payable by Johnson & Johnson for the research programs, including upon certain discovery milestones, initiation of certain clinical trials, and regulatory approval of certain licensed products in certain geographies, with an aggregate total of up to $501 million in the event ADCs directed to all three targets are advanced by Johnson & Johnson. In the event the ADCs developed by Johnson & Johnson are commercialized, we are eligible to receive

certain commercial milestones for each program upon the achievement of specified aggregate sales thresholds based on all ADCs for an applicable target, with an aggregate total of up to approximately $530 million in the event ADCs directed to all three targets are commercialized by Johnson & Johnson. In addition, we are eligible to receive tiered royalties at percentages ranging from the mid-single digits to the low-double digits on future net sales of ADCs.

The Johnson & Johnson Agreement will remain in effect, unless earlier terminated, until the expiration of the last-to-expire royalty term for the last ADC. Royalty term means on an ADC-by-ADC and country-by-country basis, the period commencing upon the first commercial sale of an ADC in such country and ending upon the latest to occur of: (a) the date of expiration of the last royalty-bearing patent claim with respect to such ADC in such country; (b) the expiration of regulatory exclusivity for such ADC in such country, if any; and (c) the tenth (10th) anniversary of the first commercial sale of such ADC in such country. Upon the expiration of the royalty term with respect to an ADC in a country, Johnson & Johnson's license becomes a perpetual, irrevocable, non-exclusive, fully-paid and royalty-free right and license, with the right to grant sublicenses, under the relevant platform technology and our interest in any joint technology to develop, manufacture, commercialize and otherwise exploit such ADC in such country.

2014 Merck KGaA Collaboration

In June 2014, we entered into a collaboration and commercial license agreement with Merck KGaA, Darmstadt, Germany, or the 2014 Merck KGaA Agreement, for the development and commercialization of ADC product candidates utilizing our Dolaflexin platform for up to six target antigens. Merck KGaA was responsible for generating antibodies against the target antigens, and we were responsible for using those antibodies to generate Dolaflexin ADC product candidates. Merck KGaA had the exclusive right to and was responsible for the further development and commercialization of these ADC product candidates. In May 2018, we entered into a supply agreement, or the 2018 Merck KGaA Supply Agreement, with Merck KGaA, Darmstadt, Germany, for the supply of materials that could be used for IND-enabling studies and clinical trials. On December 15, 2023, we and Merck KGaA mutually agreed to terminate both the 2014 Merck KGaA Agreement and the 2018 Merck Supply Agreement.

Asana Biosciences Collaboration

In March 2012, we entered into a collaboration agreement with Asana Biosciences, LLC (by assignment from Endo Pharmaceuticals Inc.),or Asana Biosciences. Pursuant to the terms of this agreement, we used Asana's novel antibodies to develop novel ADCs using components of our Dolaflexin platform. Asana Biosciences is responsible for product development, manufacturing and commercialization of any ADC products.

Synaffix Commercial License Agreement

In January 2019, we entered into a commercial license agreement with Synaffix B.V., or Synaffix, which we amended and restated in November 2021 to expand our relationship with Synaffix and amended again in February 2022 in connection with our collaboration with Johnson & Johnson. We refer to the amended and restated agreement as the Synaffix License. Under the Synaffix License, we have the right to develop, manufacture and commercialize ADCs directed to targets using Synaffix's proprietary site-specific conjugation technology for up to twelve targets. We have licensed five targets in connection with our development programs and collaborations, and we have the right to license up to six additional targets. We have paid $6.8 million related to the Synaffix License, comprised of $4.0 million in reservation and license fees, $1.8 million in milestone payments and $1.0 million which may be applied to future reservation and license fees, as well as certain portions of potential future development milestones. We will be obligated to pay in the range of $48.0 million to $132.0 million for development, regulatory and commercial milestones.

Upon commencement of commercial sales of any ADC product directed to a licensed target, if any, we are required to pay to Synaffix tiered royalties in the low-single digit percentages on net sales of the respective products. The Synaffix License remains in effect on a country-by-country and licensed product-by-licensed product basis until the expiration of the last-to-expire valid claim in a patent licensed under the Synaffix License covering such product in such country. Upon the expiration of the Synaffix License for each licensed product in each country, the licenses granted to us for such product in such country will become fully paid-up and perpetual. We may terminate the Synaffix License in its entirety or on a licensed product-by-licensed product basis at any time. Either party may terminate the Synaffix License, subject to a specified notice and cure period, for a breach by the other party of a material provision of the agreement or upon an insolvency-related event experienced by the other party.

Manufacturing

We do not own or operate and currently have no plans to establish any current good manufacturing practices, or cGMP, compliant manufacturing facilities. We currently rely, and expect to continue to rely, on external Contract Manufacturing Organizations, or CMOs, for the manufacture of product to support our activities through regulatory approval and commercial manufacturing, as well as to support our manufacturing obligations under our current collaborations. We have personnel with pharmaceutical development and manufacturing experience who are responsible for the relationships with our CMOs. In the future, we expect to use these CMOs to manufacture commercial supply of our products, which may require these CMOs to increase scale of production. We do not currently have qualified alternate suppliers in the event the current CMOs that we utilize are unable to scale production for commercial manufacturing. The Dolasynthen and Immunosynthen manufacturing processes involve readily available starting materials and use unit operations that are well-precedented in the field of chemical/pharmaceutical production. The current supply chains for XMT-1660 and XMT-2056 have several vendors in common, and based on what we know today, we believe we could use these vendors or would be able to identify and contract with other vendors on commercially reasonable terms for commercialization purposes.

Government regulation

The research, development, testing, manufacture, quality control, packaging, labeling, storage, record-keeping, distribution, import, export, promotion, advertising, marketing, sale, pricing and reimbursement of drug and biologic products are extensively regulated by governmental authorities in the United States and other countries and foreign jurisdictions, including the European Union. The processes for obtaining regulatory approvals in the United States and in foreign countries and jurisdictions, along with compliance with applicable statutes and regulations and other regulatory requirements, both pre-approval and post-approval, require the expenditure of substantial time and financial resources. The regulatory requirements applicable to biological product development, approval and marketing are subject to change, and regulations and administrative guidance often are revised or reinterpreted by the agencies in ways that may have a significant impact on our business.

U.S. government regulation of biological products

In the United States, the FDA licenses biological products, or biologics, under the Public Health Service Act, or the PHSA, and regulates such products under the Food, Drug and Cosmetic Act, or FDCA. A company, institution, or organization which takes responsibility for the initiation and management of a clinical development program for such products, and for their regulatory approval, is typically referred to as a sponsor. A sponsor seeking approval to market and distribute a new biologic in the United States must satisfactorily complete each of the following steps:

- completion of preclinical laboratory tests, animal studies and formulation studies according to good laboratory practices, or GLP, regulations or other applicable regulations;
- design of a clinical protocol and submission to the FDA of an IND, which must become effective before human clinical trials may begin and must be updated when certain changes are made;
- approval by an independent institutional review board, or IRB, or ethics committee representing each clinical trial site before each clinical trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with applicable IND regulations, good clinical practices, or GCPs, and other clinical-trial related regulations to evaluate the safety, potency and purity of the investigational product for each proposed indication;
- preparation and submission to the FDA of a BLA requesting marketing approval for one or more proposed indications, including payment of application user fees;
- review of the BLA by an FDA advisory committee, where applicable;
- satisfactory completion of one or more FDA inspections of the manufacturing facility or facilities at which the biologic is produced to assess compliance with cGMP requirements to assure that the facilities, methods and controls are adequate to preserve the product's identity, strength, quality and purity;

- satisfactory completion of any FDA audits of clinical trial sites to assure compliance with GCPs and the integrity of the clinical data submitted in support of the BLA; and

- FDA review and approval of the BLA, which may be subject to additional post- approval requirements, including the potential requirement to implement a Risk Evaluation and Mitigation Strategy, or REMS, and any post- approval clinical trials required by the FDA.

Preclinical studies

Before a sponsor begins testing a product candidate with potential therapeutic value in humans, the product candidate enters the preclinical testing stage. Preclinical tests include laboratory evaluations of product chemistry, formulation and stability, as well as other studies to evaluate, among other things, the toxicity of the product candidate. These studies are often referred to as IND-enabling studies. The conduct of the preclinical tests and formulation of the compounds for testing must comply with federal regulations and requirements, including GLP regulations and standards and the United States Department of Agriculture's Animal Welfare Act, if applicable. The results of the preclinical tests, together with manufacturing information and analytical data, are submitted to the FDA as part of an IND. Some long-term preclinical testing, such as animal tests of reproductive adverse events and carcinogenicity, and long-term toxicity studies, may continue after the IND is submitted.

The IND and IRB processes

An IND is an exemption from the FDCA that allows an unapproved product candidate to be shipped in interstate commerce for use in an investigational clinical trial and a request for FDA authorization to administer such investigational product to humans. An IND must be secured prior to interstate shipment and administration of any product candidate that is not the subject of an approved BLA. In support of a request for an IND, sponsors must submit a protocol for each clinical trial and any subsequent protocol amendments must be submitted to the FDA as part of the IND. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions about the product or conduct of the proposed clinical trial, including concerns that human research subjects will be exposed to unreasonable health risks or any issues surrounding chemistry, manufacturing and controls, or CMC, for the proposed product.In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial may proceed. As a result, submission of an IND may not result in the FDA allowing clinical trials to commence.

Following commencement of a clinical trial under an IND, the FDA may also place a clinical hold or partial clinical hold on that trial. A clinical hold is an order issued by the FDA to the sponsor to delay a proposed clinical investigation or to suspend an ongoing investigation. A partial clinical hold is a delay or suspension of only part of the clinical work requested under the IND. For example, a partial clinical hold might state that a specific protocol or part of a protocol may not proceed, while other parts of a protocol or other protocols may do so. No more than 30 days after the imposition of a clinical hold or partial clinical hold, the FDA will provide the sponsor a written explanation of the basis for the hold. Following the issuance of a clinical hold or partial clinical hold, a clinical investigation may only resume once the FDA has notified the sponsor that the investigation may proceed. The FDA will base that determination on information provided by the sponsor correcting the deficiencies previously cited or otherwise satisfying the FDA that the investigation can proceed or recommence. Occasionally, clinical holds are imposed due to manufacturing issues that may present safety issues for the clinical trial subjects.

In addition to the foregoing IND requirements, an IRB representing each institution participating in the clinical trial must review and approve the plan for any clinical trial before it commences at that institution, and the IRB must conduct continuing review and re-approve the trial at least annually. The IRB, which must operate in compliance with FDA regulations, must review and approve, among other things, the clinical trial protocol and informed consent information to be provided to trial subjects and must monitor the trial until completed. An IRB can suspend or terminate approval of a clinical trial at its institution, or an institution it represents, if the clinical trial is not being conducted in accordance with the IRB's requirements or if the product candidate has been associated with unexpected serious harm to patients.

Additionally, some trials are overseen by an independent group of qualified experts organized by the trial sponsor, known as a data safety monitoring board, or DSMB. This group provides authorization as to whether or not a trial may move forward at designated checkpoints based on review of available data from the trial, to which only the DSMB maintains access. Suspension or termination of development during any phase of a clinical trial can occur if the DSMB determines that the participants or patients are being exposed to an unacceptable health risk.

Expanded access

Expanded access, sometimes called "compassionate use," is the use of investigational new products outside of clinical trials to treat patients with serious or immediately life-threatening diseases or conditions when there are no comparable or satisfactory alternative treatment options. The rules and regulations related to expanded access are intended to improve access to investigational products for patients who may benefit from investigational therapies. FDA regulations allow access to investigational products under an IND by the company or the treating physician for treatment purposes on a case-by-case basis for: individual patients (single-patient IND applications for treatment in emergency settings and non-emergency settings); intermediate-size patient populations; and larger populations for use of the investigational product under a treatment protocol or Treatment IND Application.

When considering an IND application for expanded access to an investigational product with the purpose of treating a patient or a group of patients, the sponsor and treating physicians or investigators will determine suitability when all of the following criteria apply: patient(s) have a serious or immediately life-threatening disease or condition, and there is no comparable or satisfactory alternative therapy to diagnose, monitor, or treat the disease or condition; the potential patient benefit justifies the potential risks of the treatment and the potential risks are not unreasonable in the context or condition to be treated; and the expanded use of the investigational product for the requested treatment will not interfere with the initiation, conduct or completion of clinical investigations that could support marketing approval of the product or otherwise compromise the potential development of the product.

There is no obligation for a sponsor to make its investigational products available for expanded access; however, as required by amendments to the FDCA included in the 21st Century Cures Act, or the Cures Act, passed in 2016, if a sponsor has a policy regarding how it responds to expanded access requests with respect to product candidates in development to treat serious diseases or conditions, it must make that policy publicly available. Sponsors are required to make such policies publicly available upon the earlier of initiation of a Phase 2 or Phase 3 trial for a covered investigational product; or 15 days after the investigational product receives designation from the FDA as a breakthrough therapy, fast track product, or regenerative medicine advanced therapy.

In addition, on May 30, 2018, the Right to Try Act was signed into law. The law, among other things, provides a federal framework for certain patients to access certain investigational new products that have completed a Phase 1 clinical trial and that are undergoing investigation for FDA approval. Under certain circumstances, eligible patients can seek treatment without enrolling in clinical trials and without obtaining FDA permission under the FDA expanded access program. There is no obligation for a manufacturer to make its products available to eligible patients as a result of the Right to Try Act, but the manufacturer must develop an internal policy and respond to patient requests according to that policy.

Human clinical trials

Clinical trials involve the administration of the investigational product candidate to human subjects under the supervision of a qualified investigator in accordance with GCP requirements which include, among other things, the requirement that all research subjects provide their informed consent in writing before they participate in any clinical trial. Clinical trials are conducted under written clinical trial protocols detailing, among other things, the objectives of the trial, inclusion and exclusion criteria, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. Each protocol, and any subsequent material amendment to the protocol, must be submitted to the FDA as part of the IND, and progress reports detailing the status of the clinical trials must be submitted to the FDA annually. The FDA has issued regulations authorizing a sponsor to transfer certain responsibilities for the conduct of a clinical trial to a contract research organization, or CRO.

Human clinical trials are typically conducted in three sequential phases, but the phases may overlap or be combined. Additional trials may also be required after approval.

Phase 1 clinical trials are initially conducted in a limited population, which may be healthy volunteers or subjects with the target disease, to test the product candidate for safety, including adverse effects, dose tolerance, absorption, metabolism, distribution, excretion and pharmacodynamics in healthy humans or in patients. During Phase 1 clinical trials, information about the product candidate's pharmacokinetics and pharmacological effects may be obtained to permit the design of well-controlled and scientifically valid Phase 2 clinical trials.

Phase 2 clinical trials are generally conducted in a limited patient population to identify possible adverse effects and safety risks, evaluate the efficacy of the product candidate for specific targeted indications and determine dose tolerance and optimal dosage. Multiple Phase 2 clinical trials may be conducted by the sponsor to obtain information prior to beginning larger and more costly Phase 3 clinical trials. Phase 2 clinical trials are typically well-controlled and closely monitored.

Phase 3 clinical trials proceed if the Phase 2 clinical trials demonstrate that a dose range of the product candidate is potentially effective and has an acceptable safety profile. Phase 3 clinical trials are undertaken using a larger patient population to further evaluate dosage, provide substantial evidence of clinical efficacy and further test for safety in an expanded and diverse patient population at multiple geographically dispersed clinical trial sites. A well-controlled, statistically robust Phase 3 clinical trial may be designed to deliver the data that regulatory authorities will use to decide whether or not to approve, and, if approved, how to appropriately label a new biologic product. Such Phase 3 clinical trials are referred to as "pivotal" trials.

A clinical trial may combine the elements of more than one phase and the FDA often requires more than one Phase 3 trial to support marketing approval of a product candidate. A company's designation of a clinical trial as being of a particular phase is not necessarily indicative that the trial will be sufficient to satisfy the FDA requirements of that phase because this determination cannot be made until the protocol and data have been submitted to and reviewed by the FDA. Moreover, as noted above, a pivotal trial is a clinical trial that is believed to satisfy FDA requirements for the evaluation of a product candidate's safety and efficacy such that it can be used, alone or with other pivotal or non-pivotal trials, to support regulatory approval. Generally, pivotal trials are Phase 3 trials, but they may be Phase 2 trials if the design provides a well-controlled and reliable assessment of clinical benefit, particularly in an area of unmet medical need.

In some cases, the FDA may approve a BLA for a product candidate but require the sponsor to conduct additional clinical trials to further assess the product candidate's safety and effectiveness after approval. Such trials are typically referred to as post-approval or post-marketing clinical trials, since they are often conducted after initial marketing approval. These trials are used to gain additional experience from the treatment of a larger number of patients in the intended treatment group. In certain instances, the FDA may mandate the performance of post-approval clinical trials, such as to verify clinical benefit in the case of products approved under accelerated approval regulations. Failure to exhibit due diligence with regard to conducting mandatory Phase 4 clinical trials could result in withdrawal of FDA approval for products. In December 2022, with the passage of the Food and Drug Omnibus Reform Act, or FDORA, Congress required sponsors to develop and submit a diversity action plan for each phase 3 clinical trial or any other "pivotal study" of a new drug or biological product. These plans are meant to encourage the enrollment of more diverse patient populations in late-stage clinical trials of FDA-regulated products. Specifically, action plans must include the sponsor's goals for enrollment, the underlying rationale for those goals, and an explanation of how the sponsor intends to meet them. In addition to these requirements, the legislation directs the FDA to issue new guidance on diversity action plans. In January 2024, the FDA issued draft guidance setting out its policies for the collection of race and ethnicity data in clinical trials.In January 2024, the FDA issued draft guidance setting out its policies for the collection of race and ethnicity data in clinical trials.

In March 2022, the FDA released final guidance entitled "Expansion Cohorts: Use in First-In-Human Clinical Trials to Expedite Development of Oncology Drugs and Biologics," which outlines how developers can utilize an adaptive trial design commonly referred to as a seamless trial design in early stages of oncology biological product development (i.e., the first-in-human clinical trial) to compress the traditional three phases of trials into one continuous trial called an expansion cohort trial. Information to support the design of individual expansion cohorts are included in IND applications and assessed by FDA. Expansion cohort trials can potentially bring efficiency to product development and reduce developmental costs and time.

In June 2023, the FDA issued draft guidance with updated recommendations for GCPs aimed at modernizing the design and conduct of clinical trials. The updates are intended to help pave the way for more efficient clinical trials to facilitate the development of medical products. The draft guidance is adopted from the International Council for Harmonisation's, or the ICH, recently updated E6(R3) draft guideline that was developed to enable the incorporation of rapidly developing technological and methodological innovations into the clinical trial enterprise. In addition, the FDA issued draft guidance outlining recommendations for the implementation of decentralized clinical trials.

Finally, sponsors of clinical trials are required to register and disclose certain clinical trial information on a public registry (clinicaltrials.gov) maintained by the U.S. National Institutes of Health, or NIH. In particular, information related to the product, patient population, phase of investigation, clinical trial sites and investigators and other aspects of the clinical trial is made public as part of the registration of the clinical trial. The NIH's Final Rule on registration and reporting requirements for clinical trials became effective in 2017. Although the FDA has historically not enforced these reporting requirements due to the long delay of the U.S. Department of Health and Human Services, or HHS, the FDA has issued several pre-notices for voluntary corrective action and several notices of non-compliance during the past two years. While these notices of non-compliance did not result in civil monetary penalties, the failure to submit clinical trial information to clinicaltrials.gov, as required, is a prohibited act under the FDCA with violations subject to potential civil monetary penalties of up to $10,000 for each day the violation continues.

Interactions with FDA during the clinical development program

Following the clearance of an IND and the commencement of clinical trials, the sponsor will continue to have interactions with the FDA. Progress reports detailing the results of clinical trials must be submitted annually within 60 days of the anniversary dates that the IND went into effect and more frequently if serious adverse events occur. These reports must include a development safety update report, or DSUR. In addition, IND safety reports must be submitted to the FDA for any of the following: serious and unexpected suspected adverse reactions; findings from other trials or animal or *in vitro* testing that suggest a significant risk in humans exposed to the product; and any clinically important increase in the occurrence of a serious suspected adverse reaction over that listed in the protocol or investigator brochure. Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, or at all. The FDA will typically inspect one or more clinical sites to assure compliance with GCP and the integrity of the clinical data submitted.

In addition, sponsors are given opportunities to meet with the FDA at certain points in the clinical development program. Specifically, sponsors may meet with the FDA prior to the submission of an IND (Pre-IND meeting), at the end of Phase 2 clinical trial (EOP2 meeting) and before a BLA is submitted (Pre-BLA meeting). Meetings at other times may also be requested. There are five types of meetings that occur between sponsors and the FDA. Type A meetings are those that are necessary for an otherwise stalled product development program to proceed or to address an important safety issue. Type B meetings include pre-IND and pre-BLA meetings, as well as end of phase meetings such as EOP2 meetings. A Type C meeting is any meeting other than a Type A or Type B meeting regarding the development and review of a product, including for example meetings to facilitate early consultations on the use of a biomarker as a new surrogate endpoint that has never been previously used as the primary basis for product approval in the proposed context of use. A Type D meeting is focused on a narrow set of issues, which should be limited to no more than two focused topics, and should not require input from more than three disciplines or divisions. Finally, INTERACT meetings are intended for novel products and development programs that present unique challenges in the early development of an investigational product. The FDA has indicated that its responses, as conveyed in meeting minutes and advice letters, only constitute mere recommendations and/or advice made to a sponsor and, as such, sponsors are not bound by such recommendations and/or advice. Nonetheless, from a practical perspective, a sponsor's failure to follow the FDA's recommendations for design of a clinical program may put the program at significant risk of failure.

Clinical Studies Outside the United States in Support of FDA Approval

In connection with our clinical development program, we may conduct trials at sites outside the United States. When a foreign clinical study is conducted under an IND, all IND requirements must be met unless waived. When a foreign clinical study is not conducted under an IND, the sponsor must ensure that the study complies with certain regulatory requirements of the FDA in order to use the study as support for an IND or application for marketing approval. Specifically, the studies must be conducted in accordance with GCP, including undergoing review and receiving approval by an independent ethics committee, or IEC, and seeking and receiving informed consent from subjects. GCP requirements encompass both ethical and data integrity standards for clinical studies. The FDA's regulations are intended to help ensure the protection of human subjects enrolled in non-IND foreign clinical studies, as well as the quality and integrity of the resulting data. They further help ensure that non-IND foreign studies are conducted in a manner comparable to that required for IND studies.

The acceptance by the FDA of study data from clinical trials conducted outside the United States in support of United States approval 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 United States population and United States 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 study data are not intended to serve as the sole basis for approval, the FDA will not accept the data as support for an application for marketing approval unless the study is well-designed and well-conducted in accordance with GCP requirements and the FDA is able to validate the data from the study through an onsite inspection if deemed necessary. Many foreign regulatory authorities have similar approval requirements. In addition, such foreign trials are subject to the applicable local laws of the foreign jurisdictions where the trials are conducted.

Manufacturing and other regulatory requirements

Concurrent with clinical trials, sponsors usually complete additional animal safety studies, develop additional information about the chemistry and physical characteristics of the product candidate and finalize a process for manufacturing commercial

quantities of the product candidate in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other criteria, the sponsor must develop methods for testing the identity, strength, quality, and purity of the finished product. Additionally, appropriate packaging must be selected and tested, and stability studies must be conducted to demonstrate that the product candidate does not undergo unacceptable deterioration over its shelf life.

Specifically, the FDA's regulations require that pharmaceutical products be manufactured in specific approved facilities and in accordance with cGMPs. The cGMP regulations include requirements relating to organization of personnel, buildings and facilities, equipment, control of components and product containers and closures, production and process controls, packaging and labeling controls, holding and distribution, laboratory controls, records and reports and returned or salvaged products. Manufacturers and other entities involved in the manufacture and distribution of approved pharmaceuticals are required to register their establishments with the FDA and some state agencies, and they are subject to periodic unannounced inspections by the FDA for compliance with cGMPs and other requirements. The PREVENT Pandemics Act, which was enacted in December 2022, clarifies that foreign drug manufacturing establishments are subject to registration and listing requirements even if a drug or biologic undergoes further manufacture, preparation, propagation, compounding, or processing at a separate establishment outside the United States prior to being imported or offered for import into the United States.

Inspections must follow a "risk-based schedule" that may result in certain establishments being inspected more frequently. Manufacturers may also have to provide, on request, electronic or physical records regarding their establishments. Delaying, denying, limiting, or refusing inspection by the FDA may lead to a product being deemed to be adulterated. Changes to the manufacturing process, specifications or container closure system for an approved product are strictly regulated and often require prior FDA approval before being implemented. The FDA's regulations also require, among other things, the investigation and correction of any deviations from cGMP and the imposition of reporting and documentation requirements upon the sponsor and any third-party manufacturers involved in producing the approved product.

Manufacturers and others involved in the manufacture and distribution of products must also register their establishments with the FDA and certain state agencies. Both domestic and foreign manufacturing establishments must register and provide additional information to the FDA upon their initial participation in the manufacturing process. Any product manufactured by or imported from a facility that has not registered, whether foreign or domestic, is deemed misbranded under the FDCA. The manufacturing facilities may be subject to periodic unannounced inspections by government authorities to ensure compliance with cGMPs and other laws. If a manufacturing facility is not in substantial compliance with the applicable regulations and requirements imposed when the product was approved, regulatory enforcement action may be taken, which may include a warning letter or an injunction against shipment of products from the facility and/or recall of products previously shipped.

Pediatric trials

Under the Pediatric Research Equity Act, or PREA, applications and certain types of supplements to applications must contain data that are adequate to assess the safety and effectiveness of the product 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 sponsor must submit an initial Pediatric Study Plan, or PSP, within 60 days of an end-of-phase 2 meeting or as may be agreed between the sponsor and the FDA. Those plans must contain an outline of the proposed pediatric clinical trial or trials that the sponsor plans to conduct, including trial objectives and design, age groups, relevant endpoints and statistical approach, or a justification for not including such detailed information, and any request for a deferral of pediatric assessments or a full or partial waiver of the requirement to provide data from pediatric trials along with supporting information. The sponsor and the FDA must reach agreement on a final plan. A sponsor can submit amendments to an agreed-upon initial PSP at any time if changes to the pediatric plan need to be considered based on data collected from nonclinical studies, early phase clinical trials, and/or other clinical development programs.

For investigational products intended to treat a serious or life-threatening disease or condition, the FDA must, upon the request of a sponsor, meet to discuss preparation of the initial PSP or to discuss deferral or waiver of pediatric assessments. In addition, the FDA will meet early in the development process to discuss PSPs with sponsors, and the FDA must meet with sponsors by no later than the end-of-Phase 1 meeting for serious or life-threatening diseases and by no later than ninety days after the FDA's receipt of the PSP.

The FDA may, on its own initiative or at the request of the sponsor, grant deferrals for submission of some or all pediatric data until after approval of the product for use in adults, or full or partial waivers from the pediatric data requirements. A deferral may be granted for several reasons, including a finding that the product or therapeutic candidate is ready for approval for use in adults before pediatric trials are complete or that additional safety or effectiveness data needs to be collected before the

pediatric trials begin. The FDA is required to send a PREA Non-Compliance letter to sponsors who have failed to submit their pediatric assessments required under PREA and have failed to seek or obtain a deferral or deferral extension or have failed to request approval for a required pediatric formulation. In May 2023, the FDA issued new draft guidance that further describes the pediatric study requirements under PREA.

Unless otherwise required by regulation, the pediatric data requirements do not apply to products with orphan designation, although FDA has taken steps to limit what it considers abuse of this statutory exemption in PREA. Further, Section 505B of the FDCA, as amended by the FDA Reauthorization Act of 2017, requires that any original NDA or BLA submitted on or after August 18, 2020, for a new active ingredient, must contain reports on the molecularly targeted pediatric cancer investigation, unless the requirement is waived or deferred, if the drug that is the subject of the application is: (1) intended for the treatment of an adult cancer, and (2) directed at a molecular target that the Secretary determines to be substantially relevant to the growth or progression of a pediatric cancer in accordance with FDA guidance. The FDA also maintains a list of diseases that are exempt from PREA requirements due to low prevalence of disease in the pediatric population.

Expedited review programs

The FDA is authorized to expedite the review of applications in several ways. Under the Fast Track program, the sponsor of a product candidate may request the FDA to designate the product for a specific indication as a Fast Track product concurrent with or after the filing of the IND. Candidate products are eligible for Fast Track designation if they are intended to treat a serious or life-threatening condition and demonstrate the potential to address unmet medical needs for the condition. Fast Track designation applies to the combination of the product candidate and the specific indication for which it is being studied. In addition to other benefits, such as the ability to have greater interactions with the FDA, the FDA may initiate review of sections of a Fast Track application before the application is complete, a process known as rolling review.

Any product candidate submitted to the FDA for marketing, including under a Fast Track program, may be eligible for other types of FDA programs intended to expedite development and review, such as breakthrough therapy designation, priority review and accelerated approval.

- *Breakthrough therapy designation.* To qualify for the breakthrough therapy program, product candidates must be intended to treat a serious or life-threatening disease or condition and preliminary clinical evidence must indicate that such product candidates may demonstrate substantial improvement on one or more clinically significant endpoints over existing therapies. The FDA will seek to ensure the sponsor of a breakthrough therapy product candidate receives intensive guidance on an efficient development program, intensive involvement of senior managers and experienced staff on a proactive, collaborative and cross-disciplinary review and rolling review.

- *Priority review.* A product candidate is eligible for priority review if it treats a serious condition and, if approved, it would be a significant improvement in the safety or effectiveness of the treatment, diagnosis or prevention compared to marketed products. FDA aims to complete its review of priority review applications within six months as opposed to 10 months for standard review.

- *Accelerated approval.* Biologic products studied for their safety and effectiveness in treating serious or life-threatening illnesses and that provide meaningful therapeutic benefit over existing treatments may receive accelerated approval. Accelerated approval means that a product candidate may be approved on the basis of adequate and well controlled clinical trials establishing that the product candidate has an effect on a surrogate endpoint that is reasonably likely to predict a clinical benefit, or on the basis of an effect on a clinical endpoint other than survival or irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity and prevalence of the condition and the availability or lack of alternative treatments. As a condition of approval, the FDA may require that a sponsor of a biologic product candidate receiving accelerated approval perform adequate and well controlled post-marketing clinical trials. In addition, the FDA currently requires as a condition for accelerated approval pre-approval of promotional materials.

  With passage of FDORA in December 2022, Congress modified certain provisions governing accelerated approval of drug and biologic products. Specifically, the new legislation authorized the FDA to: require a sponsor to have its confirmatory clinical trial underway before accelerated approval is awarded; require a sponsor of a product granted accelerated approval to submit progress reports on its post-approval studies to the FDA every six months, until the study is completed; and use expedited procedures to withdraw accelerated approval of a new drug application or BLA after the confirmatory trial fails to verify the product's clinical benefit. Further, FDORA requires the agency to publish on its website "the rationale for why a post-approval study is not appropriate or necessary" whenever it decides not to require such a study upon granting accelerated approval.

In March 2023, the FDA issued draft guidance that outlines its current thinking and approach to accelerated approval. The FDA indicated that the accelerated approval pathway is commonly used for approval of oncology drugs due to the serious and life-threatening nature of cancer. Although single-arm trials have been commonly used to support accelerated approval, a randomized controlled trial is the preferred approach as it provides a more robust efficacy and safety assessment and allows for direct comparisons to an available therapy. To that end, the FDA outlined considerations for designing, conducting, and analyzing data for trials intended to support accelerated approvals of oncology therapeutics. While this guidance is currently only in draft form and will ultimately not be legally binding even when finalized, sponsors typically observe the FDA's guidance closely to ensure that their investigational products qualify for accelerated approval.

- *Regenerative advanced therapy.* With passage of the 21st Century Cures Act, or the Cures Act, in December 2016, Congress authorized the FDA to accelerate review and approval of products designated as regenerative advanced therapies. A product is eligible for this designation if it is a regenerative medicine therapy that is intended to treat, modify, reverse or cure a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the product candidate has the potential to address unmet medical needs for such disease or condition. The benefits of a regenerative advanced therapy designation include early interactions with the FDA to expedite development and review, benefits available to breakthrough therapies, potential eligibility for priority review and accelerated approval based on surrogate or intermediate endpoints.

None of these expedited programs changes the standards for approval but each may help expedite the development or approval process governing product candidates.

Submission and filing of BLAs

Assuming successful completion of the required clinical testing, the results of the preclinical studies and clinical trials, along with information relating to the product's chemistry, manufacturing, controls, safety updates, patent information, abuse information and proposed labeling, are submitted to the FDA as part of an application requesting approval to market the product candidate for one or more indications. To support marketing approval, the data submitted must be sufficient in quality and quantity to establish the safety, potency and purity of the biological product to the satisfaction of the FDA. The fee required for the submission of a BLA under the Prescription Drug User Fee Act, or PDUFA, is substantial (for example, for federal fiscal year 2024, this application fee is approximately $4,048,695), and the sponsor of an approved BLA is also subject to an annual program fee, currently set at $416,734 per eligible prescription drug product for federal fiscal year 2024. These fees are typically adjusted annually, and exemptions and waivers may be available under certain circumstances, including where the applicant is a small business submitting its first human therapeutic application for review.

The FDA conducts a preliminary review of all applications within 60 days of receipt and must inform the sponsor at that time or before whether an application is sufficiently complete to permit substantive review. In pertinent part, FDA's regulations state that an application "shall not be considered as filed until all pertinent information and data have been received" by the FDA. In the event that FDA determines that an application does not satisfy this standard, it will issue a Refuse to File, or RTF, determination to the applicant. Typically, an RTF will be based on administrative incompleteness, such as clear omission of information or sections of required information such that substantive and meaningful review is precluded. The FDA may request additional information rather than accept an application for filing. In this event, the application must be resubmitted with the additional information. The resubmitted application is also subject to review before the FDA accepts it for filing.

After the submission is accepted for filing, the FDA begins an in-depth substantive review of the application. The FDA reviews the application to determine, among other things, whether the proposed product is safe and effective for its intended use, whether it has an acceptable purity profile and whether the product is being manufactured in accordance with cGMP. Under the goals and policies agreed to by the FDA under PDUFA, the FDA has ten months from the filing date in which to complete its initial review of a standard application that is a new molecular entity, and six months from the filing date for an application with "priority review." The review process may be extended by the FDA for three additional months to consider new information or in the case of a clarification provided by the applicant to address an outstanding deficiency identified by the FDA following the original submission. Despite these review goals, it is not uncommon for FDA review of an application to extend beyond the PDUFA goal date.

In connection with its review of an application, the FDA will typically submit information requests to the applicant and set deadlines for responses thereto. The FDA will also conduct a pre-approval inspection of the manufacturing facilities for the new product to determine whether the manufacturing processes and facilities comply with cGMPs. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and are adequate to assure consistent production of the product within required specifications.

The FDA also may inspect the sponsor and one or more clinical trial sites to assure compliance with IND and GCP requirements and the integrity of the clinical data submitted to the FDA. With passage of FDORA, Congress clarified the FDA's authority to conduct inspections by expressly permitting inspections of facilities involved in the preparation, conduct, or analysis of clinical and non-clinical studies submitted to the FDA as well as other persons holding study records or involved in the study process.

Additionally, the FDA may refer an application, including applications for novel product candidates which present difficult questions of safety or efficacy, to an advisory committee for review, evaluation and recommendation as to whether the application should be approved and under what conditions. Typically, an advisory committee is a panel of independent experts, including clinicians and other scientific experts that reviews, evaluates and provides a recommendation as to whether the application should be approved and under what conditions. The FDA is not bound by the recommendation of an advisory committee, but it considers such recommendations when making final decisions on approval.

The FDA also may require submission of a REMS if it determines that a REMS is necessary to ensure that the benefits of the product outweigh its risks and to assure the safe use of the product. The REMS could include medication guides, physician communication plans, assessment plans and/or elements to assure safe use, such as restricted distribution methods, patient registries or other risk minimization tools. The FDA determines the requirement for a REMS, as well as the specific REMS provisions, on a case-by-case basis. If the FDA concludes a REMS is needed, the sponsor of the application must submit a proposed REMS and the FDA will not approve the application without a REMS.

Decisions on BLAs

After evaluating the application and all related information, including the advisory committee recommendations, if any, and inspection reports of manufacturing facilities and clinical trial sites, the FDA will issue either a Complete Response Letter, or CRL, or an approval letter. To reach this determination, the FDA must determine that the expected benefits of the proposed product outweigh its potential risks to patients. This assessment is informed by the severity of the underlying condition and how well patients' medical needs are addressed by currently available therapies; uncertainty about how the premarket clinical trial evidence will extrapolate to real-world use of the product in the post-market setting; and whether risk management tools are necessary to manage specific risks.

A CRL indicates that the review cycle of the application is complete, and the application will not be approved in its present form. A CRL generally outlines the deficiencies in the submission and may require substantial additional testing or information in order for the FDA to reconsider the application. The CRL may require additional clinical or other data, additional pivotal Phase 3 clinical trial(s) and/or other significant and time- consuming requirements related to clinical trials, preclinical studies or manufacturing. If a CRL is issued, the applicant will have one year to respond to the deficiencies identified by the FDA, at which time the FDA can deem the application withdrawn or, in its discretion, grant the applicant an additional six month extension to respond. The FDA has committed to reviewing resubmissions in response to an issued CRL in either two or six months depending on the type of information included. Even with the submission of this additional information, however, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

An approval letter, on the other hand, authorizes commercial marketing of the product with specific prescribing information for specific indications. That is, the approval will be limited to the conditions of use (e.g., patient population, indication) described in the FDA-approved labeling. Further, depending on the specific risk(s) to be addressed, the FDA may require that contraindications, warnings or precautions be included in the product labeling, require that post-approval trials, including Phase 4 clinical trials, be conducted to further assess a product's safety after approval, require testing and surveillance programs to monitor the product after commercialization or impose other conditions, including distribution and use restrictions or other risk management mechanisms under a REMS which can materially affect the potential market and profitability of the product. The FDA may prevent or limit further marketing of a product based on the results of post-marketing trials or surveillance programs. After approval, some types of changes to the approved product, such as adding new indications, manufacturing changes and additional labeling claims, are subject to further testing requirements and FDA review and approval.

Post-approval requirements

Following approval of a new prescription product, the manufacturer, the approved product and the product's manufacturing locations are subject to pervasive and continuing regulation by the FDA, governing, among other things, monitoring and record-keeping activities, reporting of adverse experiences with the product and product problems to the FDA, product sampling and distribution, manufacturing and promotion and advertising. Although physicians may prescribe legally available products for unapproved uses or patient populations (i.e., "off-label uses"), manufacturers may not market or promote such uses. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a

company that is found to have improperly promoted off-label uses may be subject to significant liability. In September 2021, the FDA published final regulations which describe the types of evidence that the agency will consider in determining the intended use of a biologic.

It may be permissible, under very specific, narrow conditions, for a manufacturer to engage in non-promotional, non-misleading communication regarding off-label information, such as distributing scientific or medical journal information. Moreover, with passage of the Pre-Approval Information Exchange Act in December 2022, sponsors of products that have not been approved may proactively communicate to payors certain information about products in development to help expedite patient access upon product approval. Previously, such communications were permitted under FDA guidance but the new legislation explicitly provides protection to sponsors who convey certain information about products in development to payors, including unapproved uses of approved products. In addition, in October 2023, the FDA published draft guidance outlining the FDA's non-binding policies governing the distribution of scientific information on unapproved uses to healthcare providers. This draft guidance calls for such communications to be truthful, non-misleading, factual, and unbiased and include all information necessary for healthcare providers to interpret the strengths and weaknesses and validity and utility of the information about the unapproved use.

If a company is found to have promoted off-label uses, it may become subject to administrative and judicial enforcement by the FDA, the Department of Justice, or the Office of the Inspector General of the Department of Health and Human Services, as well as state authorities. This could subject a company to a range of penalties that could have a significant commercial impact, including civil and criminal fines and agreements that materially restrict the manner in which a company promotes or distributes products, as well as adverse public relations and reputational harm. The federal government has levied large civil and criminal fines against companies for alleged improper promotion, and has also requested that companies enter into consent decrees or permanent injunctions under which specified promotional conduct is changed or curtailed.

Further, if there are any modifications to the product, including changes in indications, labeling or manufacturing processes or facilities, the sponsor may be required to submit and obtain FDA approval of a new application or supplement, which may require the sponsor to develop additional data or conduct additional preclinical studies and clinical trials. Securing FDA approval for new indications is similar to the process for approval of the original indication and requires, among other things, submitting data from adequate and well-controlled clinical trials to demonstrate the product's safety and efficacy in the new indication. Even if such trials are conducted, the FDA may not approve any expansion of the labeled indications for use in a timely fashion, or at all. There also are continuing, annual user fee requirements that are now assessed as program fees for certain products.

In addition, the FDA may withdraw the 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 mandatory revisions to the approved labeling to add new safety information, imposition of post-market clinical trials requirement to assess new safety risks or imposition of distribution or other restrictions under a REMS program.

Other potential consequences include, among other things:

- restrictions on the marketing or manufacturing of the product, complete withdrawal of the product from the market or product recalls;
- safety alerts, Dear Healthcare Provider letters, press releases or other communications containing warnings or other safety information about a product;
- mandated modification of promotional materials and labeling and issuance of corrective information;
- fines, warning letters, untitled letters or other enforcement-related letters or clinical holds on post-approval clinical trials;
- refusal of the FDA to approve pending applications or supplements to approved applications, or suspension or revocation of product approvals;
- product seizure or detention, or refusal to permit the import or export of products;
- injunctions or the imposition of civil or criminal penalties; and

- consent decrees, corporate integrity agreements, debarment, or exclusion from federal health care programs.

Regulatory exclusivity governing biologics

When a biological product is licensed for marketing by FDA with approval of a BLA, the product may be entitled to certain types of market and data exclusivity barring FDA from approving competing products for certain periods of time. In March 2010, the Patient Protection and Affordable Care Act was enacted in the United States and included the Biologics Price Competition and Innovation Act of 2009, or the BPCIA. The BPCIA amended the PHSA to create an abbreviated approval pathway for biological products that are biosimilar to or interchangeable with an FDA-licensed reference biological product. To date, the FDA has approved a number of biosimilar products and interchangeable biosimilar products.

Under the BPCIA, a manufacturer may submit an application for a product that is "biosimilar to" a previously approved biological product, which the statute refers to as a "reference product." In order for the FDA to approve a biosimilar product, it must find that there are no clinically meaningful differences between the reference product and the proposed biosimilar product in terms of safety, purity and potency. The biosimilar sponsor may demonstrate that its product is biosimilar to the reference product on the basis of data from analytical studies, animal studies and one or more clinical trials to demonstrate safety, purity and potency in one or more appropriate conditions of use for which the reference product is approved.

For the FDA to approve a biosimilar product as interchangeable with a reference product, the agency must find not only that the product is biosimilar to the reference product but also that it can be expected to produce the same clinical results as the reference product such that the two products may be switched without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic. Upon licensure by the FDA, an interchangeable biosimilar may be substituted for the reference product without the intervention of the health care provider who prescribed the reference product. Following approval of the interchangeable biosimilar product, the FDA may not grant interchangeability status for any second biosimilar until one year after the first commercial marketing of the first interchangeable biosimilar product. Congress clarified through FDORA that the FDA may approve multiple first interchangeable biosimilar biological products so long as the products are all approved on the first day on which such a product is approved as interchangeable with the reference product.

A reference biological product is granted 12 years of exclusivity from the time of first licensure of the product, and the FDA will not accept an application for a biosimilar or interchangeable product based on the reference biological product until four years after the date of first licensure of the reference product. Even if a product is considered to be a reference product eligible for exclusivity, however, another company could market a competing version of that product if the FDA approves a full BLA for such 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. There have been recent government proposals to reduce the 12-year reference product exclusivity period, but none has been enacted to date. At the same time, since passage of the BPCIA, many states have passed laws or amendments to laws, which address pharmacy practices involving biosimilar products.

Orphan drug designation and exclusivity

Orphan drug designation in the United States is designed to encourage sponsors to develop products intended for treatment of rare diseases or conditions. In the United States, a rare disease or condition is statutorily defined as a condition that affects fewer than 200,000 individuals in the United States or that affects more than 200,000 individuals in the United States and for which there is no reasonable expectation that the cost of developing and making available the product for the disease or condition will be recovered from sales of the product in the United States.

Orphan drug designation qualifies a company for tax credits and potentially market exclusivity for seven years following the date of the product's approval if granted by the FDA. An application for designation as an orphan product can be made any time prior to the filing of an application for approval to market the product. A product becomes an orphan when it receives orphan drug designation from the Office of Orphan Products Development at the FDA based on acceptable confidential requests. The product must then go through the review and approval process like any other product.

A sponsor may request orphan drug designation of a previously unapproved product or new orphan indication for an already marketed product. In addition, a sponsor of a product that is otherwise the same product as an already approved orphan drug may seek and obtain orphan drug designation for the subsequent product for the same rare disease or condition if it can present a plausible hypothesis that its product may be clinically superior to the first approved product. More than one sponsor may receive orphan drug designation for the same product for the same rare disease or condition, but each sponsor seeking orphan drug designation must file a complete request for designation.

If a product with orphan designation receives the first FDA approval for the disease or condition for which it has such designation or for a select indication or use within the rare disease or condition for which it was designated, the product generally will receive orphan drug exclusivity. Orphan drug exclusivity means that the FDA may not approve another sponsor's marketing application for the same product for the same disease or condition for seven years, except in certain limited circumstances. If a product designated as an orphan drug ultimately receives marketing approval for an indication broader than what was designated in its orphan drug application, it may not be entitled to exclusivity.

The period of market exclusivity begins on the date that the marketing application is approved by the FDA and applies only to the disease or condition for which the product has been designated. Orphan drug exclusivity will not bar approval of another product under certain circumstances, including if the company with orphan drug exclusivity is not able to meet market demand or the subsequent product is shown to be clinically superior to the approved product on the basis of greater efficacy or safety, or providing a major contribution to patient care. Under Omnibus legislation signed by President Trump on December 27, 2020, the requirement for a product to show clinical superiority applies to drug products that received orphan drug designation before enactment of amendments to the FDCA in 2017 but have not yet been approved by FDA.

In September 2021, the Court of Appeals for the 11th Circuit held that, for the purpose of determining the scope of market exclusivity, the term "same disease or condition" in the statute means the designated "rare disease or condition" and could not be interpreted by the FDA to mean the "indication or use." Thus, the court concluded, orphan drug exclusivity applies to the entire designated disease or condition rather than the "indication or use." Although there have been legislative proposals to overrule this decision, they have not been enacted into law. On January 23, 2023, the FDA announced that, in matters beyond the scope of that court order, the FDA will continue to apply its existing regulations tying orphan-drug exclusivity to the uses or indications for which the orphan drug was approved.

Pediatric exclusivity

Pediatric exclusivity is a type of non-patent marketing exclusivity in the United States and, if granted, provides for the attachment of an additional six months of exclusivity. For biologic products, the six month period may be attached to any existing regulatory exclusivities but not to any patent terms. The conditions for pediatric exclusivity include the FDA's determination that information relating to the use of a new product in the pediatric population may produce health benefits in that population, the FDA making a written request for pediatric clinical trials, and the sponsor agreeing to perform, and reporting on, the requested clinical trials within the statutory timeframe. This six-month exclusivity may be granted if a sponsor submits pediatric data that fairly respond to a written request from the FDA for such data. The data do not need to show the product to be effective in the pediatric population studied. If reports of requested pediatric studies are submitted to and accepted by the FDA within the statutory time limits, whatever statutory or regulatory periods of exclusivity or patents that cover the product are extended by six months. Although this is not a patent term extension, it effectively extends the regulatory period during which the FDA cannot approve another application.

Patent term restoration and extension

In the United States, a patent claiming a new product, its method of use or its method of manufacture may be eligible for a limited patent term extension under the Hatch-Waxman Act, which permits a patent extension of up to five years for patent term lost during product development and FDA regulatory review. Assuming grant of the patent for which the extension is sought, the restoration period for a patent covering a product is typically one-half the time between the effective date of the IND involving human beings and the submission date of the BLA, plus the time between the submission date of the application and the ultimate approval date. Patent term restoration cannot be used to extend the remaining term of a patent past a total of 14 years from the product's approval date in the United States. Only one patent applicable to an approved product is eligible for the extension, and the application for the extension must be submitted prior to the expiration of the patent for which extension is sought. A patent that covers multiple products for which approval is sought can only be extended in connection with one of the approvals. The USPTO reviews and approves the application for any patent term extension in consultation with the FDA.

Companion diagnostics

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, for novel biologics, a companion diagnostic device and its corresponding therapeutic should be approved or cleared contemporaneously by the FDA for the use indicated in the therapeutic product's labeling. 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. In July 2016, the FDA issued a draft guidance intended to assist sponsors of the therapeutic product and *in vitro* companion diagnostic device on issues related to co-development of the products.

The 2014 guidance also explains that a companion diagnostic device used to make treatment decisions in clinical trials of a biologic product candidate generally will be considered an investigational device, unless it is employed for an intended use for which the device is already approved or cleared. If used to make critical treatment decisions, such as patient selection, the diagnostic device generally will be considered a significant risk device under the FDA's Investigational Device Exemption, or IDE, regulations. Thus, the sponsor of the diagnostic device will be required to comply with the IDE regulations. According to the guidance, if a diagnostic device and a product are to be studied together to support their respective approvals, both products can be studied in the same investigational study, if the study meets both the requirements of the IDE regulations and the IND regulations. The guidance provides that depending on the details of the study plan and subjects, a sponsor may seek to submit an IND application alone, or both an IND- and IDE-application.

In April 2020, the FDA issued additional guidance which describes considerations for the development and labeling of companion diagnostic devices to support the indicated uses of multiple biological oncology products, when appropriate. This guidance builds upon existing policy regarding the labeling of companion diagnostics. In its 2014 guidance, the FDA stated that if evidence is sufficient to conclude that the companion diagnostic is appropriate for use with a specific group of therapeutic products, the companion diagnostic's intended use/indications for use should name the specific group of therapeutic products, rather than specific products. The 2020 guidance expands on the policy statement in the 2014 guidance by recommending that companion diagnostic developers consider a number of factors when determining whether their test could be developed, or the labeling for approved companion diagnostics could be revised through a supplement, to support a broader labeling claim such as use with a specific group of oncology therapeutic products (rather than listing an individual therapeutic product(s)).

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 pre-notification marketing clearance or approval from the FDA prior to commercial distribution.The FDA previously has required *in vitro* companion diagnostics intended to select the patients who will respond to the product candidate to obtain pre-market approval, or PMA, simultaneously with approval of the therapeutic product candidate. 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 sponsor 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, which for federal fiscal year 2024 is $483,560 and the small business fee is $120,890.

Healthcare compliance

In the United States, biopharmaceutical manufacturers and their products are subject to extensive regulation at the federal and state level, such as laws intended to prevent fraud and abuse in the healthcare industry. Healthcare providers and third-party payors play a primary role in the recommendation and prescription of pharmaceutical products that are granted marketing approval. Arrangements with providers, consultants, third-party payors, and customers are subject to broadly applicable fraud and abuse, anti-kickback, false claims laws, reporting of payments to healthcare providers and patient privacy laws and regulations and other healthcare laws and regulations that may constrain our business and/or financial arrangements. Restrictions under applicable federal and state healthcare laws and regulations, including certain laws and regulations applicable only if we have marketed products, include the following:

- federal false claims, false statements and civil monetary penalties laws prohibiting, among other things, any person from knowingly presenting, or causing to be presented, a false claim for payment of government funds or knowingly making, or causing to be made, a false statement to get a false claim paid;

- federal healthcare program anti-kickback law, which prohibits, among other things, persons from offering, soliciting, receiving or providing remuneration, directly or indirectly, to induce either the referral of an individual for, or the purchasing or ordering of, a good or service for which payment may be made under federal healthcare programs such as Medicare and Medicaid;

- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which, in addition to privacy protections applicable to healthcare providers and other entities, prohibits executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters;

- federal laws that require pharmaceutical manufacturers to report certain calculated product prices to the government or provide certain discounts or rebates to government authorities or private entities, often as a condition of reimbursement under government healthcare programs;

- federal Open Payments (or federal "sunshine" law), which requires pharmaceutical and medical device companies to monitor and report certain financial interactions with certain healthcare providers to the Center for Medicare & Medicaid Services, or CMS, within the HHS for re-disclosure to the public, as well as ownership and investment interests held by physicians and their immediate family members;

- federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers;

- analogous state laws and regulations, including: state anti-kickback and false claims laws; state laws requiring pharmaceutical companies to comply with specific compliance standards, restrict financial interactions between pharmaceutical companies and healthcare providers or require pharmaceutical companies to report information related to payments to health care providers or marketing expenditures; and state laws governing privacy, security and breaches of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA, thus complicating compliance efforts; and

- laws and regulations prohibiting bribery and corruption such as the Foreign Corrupt Practices Act, which, among other things, prohibits U.S. companies and their employees and agents from authorizing, promising, offering, or providing, directly or indirectly, corrupt or improper payments or anything else of value to foreign government officials, employees of public international organizations or foreign government-owned or affiliated entities, candidates for foreign public office, and foreign political parties or officials thereof.

Violations of these laws are punishable by criminal and/or civil sanctions, including, in some instances, exclusion from participation in federal and state health care programs, such as Medicare and Medicaid. Ensuring compliance is time consuming and costly. Similar healthcare laws and regulations exist in the European Union and other jurisdictions, including reporting requirements detailing interactions with and payments to healthcare providers and laws governing the privacy and security of personal information.

Healthcare reform

A primary trend in the U.S. healthcare industry and elsewhere is cost containment. There have been a number of federal and state proposals during the last few years regarding the pricing of pharmaceutical products, limiting coverage and reimbursement for medical products and other changes to the healthcare system in the United States.

In March 2010, the United States Congress enacted the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively the PPACA, which, among other things, includes changes to the coverage and payment for pharmaceutical products under government healthcare programs. Other legislative changes have been proposed and adopted since the PPACA was enacted. In August 2011, the Budget Control Act of 2011, among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. These changes included aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, which went into effect in April 2013 and will remain in effect through 2031.

Since enactment of the PPACA, there have been, and continue to be, numerous legal challenges and Congressional actions to repeal and replace provisions of the law. For example, with enactment of the Tax Cuts and Jobs Act of 2017, or the Tax Act, which was signed by President Trump on December 22, 2017, Congress repealed the "individual mandate." The repeal of this provision, which requires most Americans to carry a minimal level of health insurance, became effective in 2019. On June 17, 2021, the U.S. Supreme Court dismissed the most recent judicial challenge to the PPACA brought by several states without specifically ruling on the constitutionality of the PPACA. Litigation and legislation over the PPACA are likely to continue, with unpredictable and uncertain results.

The Trump Administration also took executive actions to undermine or delay implementation of the PPACA, including directing federal agencies with authorities and responsibilities under the PPACA to waive, defer, grant exemptions from, or

delay the implementation of any provision of the PPACA that would impose a fiscal or regulatory burden on states, individuals, healthcare providers, health insurers, or manufacturers of pharmaceuticals or medical devices. On January 28, 2021, however, President Biden rescinded those orders and issued a new executive order that directs federal agencies to reconsider rules and other policies that limit access to healthcare, and consider actions that will protect and strengthen that access. Under this order, federal agencies are directed to re-examine: policies that undermine protections for people with pre-existing conditions, including complications related to COVID-19; demonstrations and waivers under Medicaid and the PPACA that may reduce coverage or undermine the programs, including work requirements; policies that undermine the Health Insurance Marketplace or other markets for health insurance; policies that make it more difficult to enroll in Medicaid and under the PPACA; and policies that reduce affordability of coverage or financial assistance, including for dependents.

Pharmaceutical prices

The prices of prescription pharmaceuticals have also been the subject of considerable discussion in the United States. There have been several recent U.S. congressional inquiries, as well as proposed and enacted state and federal legislation designed to, among other things, bring more transparency to pharmaceutical pricing, review the relationship between pricing and manufacturer patient programs, and reduce the costs of pharmaceuticals under Medicare and Medicaid. In 2020, President Trump issued several executive orders intended to lower the costs of prescription products and certain provisions in these orders have been incorporated into regulations. These regulations include an interim final rule implementing a most favored nation model for prices that would tie Medicare Part B payments for certain physician-administered pharmaceuticals to the lowest price paid in other economically advanced countries, effective January 1, 2021. That rule, however, has been subject to a nationwide preliminary injunction and, on December 29, 2021, CMS issued a final rule to rescind it. With issuance of this rule, CMS stated that it will explore all options to incorporate value into payments for Medicare Part B pharmaceuticals and improve beneficiaries' access to evidence-based care.

In addition, in October 2020, HHS and the FDA published a final rule allowing states and other entities to develop a Section 804 Importation Program, or SIP, to import certain prescription drugs from Canada into the United States. That regulation was challenged in a lawsuit by the Pharmaceutical Research and Manufacturers of America, or PhRMA, but the case was dismissed by a federal district court in February 2023 after the court found that PhRMA did not have standing to sue HHS. Several states have passed laws allowing for the importation of drugs from Canada. Certain of these states have submitted Section 804 Importation Program proposals and are awaiting FDA approval. On January 5, 2023, the FDA approved Florida’s plan for Canadian drug importation.

Further, on November 20, 2020, HHS finalized a regulation removing safe harbor protection for price reductions from pharmaceutical manufacturers to plan sponsors under Part D, either directly or through pharmacy benefit managers, unless the price reduction is required by law. The rule also creates a new safe harbor for price reductions reflected at the point-of-sale, as well as a safe harbor for certain fixed fee arrangements between pharmacy benefit managers and manufacturers. Pursuant to court order, the removal and addition of the aforementioned safe harbors were delayed and recent legislation imposed a moratorium on implementation of the rule until January 1, 2026. The Inflation Reduction Act of 2022, or IRA, further delayed implementation of this rule to January 1, 2032.

On July 9, 2021, President Biden signed Executive Order 14063, which focuses on, among other things, the price of pharmaceuticals. The Order directs the HHS to create a plan within 45 days to combat “excessive pricing of prescription pharmaceuticals and enhance domestic pharmaceutical supply chains, to reduce the prices paid by the federal government for such pharmaceuticals, and to address the recurrent problem of price gouging.” On September 9, 2021, HHS released its plan to reduce pharmaceutical prices. The key features of that plan are to: (a) make pharmaceutical prices more affordable and equitable for all consumers and throughout the health care system by supporting pharmaceutical price negotiations with manufacturers; (b) improve and promote competition throughout the prescription pharmaceutical industry by supporting market changes that strengthen supply chains, promote biosimilars, and increase transparency; and (c) foster scientific innovation to promote better healthcare and improve health by supporting public and private research and making sure that market incentives promote discovery of valuable and accessible new treatments.

On August 16, 2022, the Inflation Reduction Act of 2022, or IRA, was signed into law by President Biden. The new legislation has implications for Medicare Part D, which is a program available to individuals who are entitled to Medicare Part A or enrolled in Medicare Part B to give them the option of paying a monthly premium for outpatient prescription drug coverage. Among other things, the IRA requires manufacturers of certain drugs to engage in price negotiations with Medicare beginning in 2026, with prices that can be negotiated subject to a cap; 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 HHS to implement many of these provisions through guidance, as opposed to regulation, for the initial years.

Specifically, with respect to price negotiations, Congress authorized Medicare to negotiate lower prices for certain costly single-source drug and biologic products that do not have competing generics or biosimilars and are reimbursed under Medicare Part B and Part D. CMS may negotiate prices for ten high-cost drugs paid for by Medicare Part D starting in 2026, followed by 15 additional Part D drugs in 2027, 15 additional Part B or Part D drugs in 2028, and 20 additional Part B or Part D drugs in 2029 and beyond. This provision applies to drug products that have been approved for at least nine years and biologics that have been licensed for 13 years, but it does not apply to drugs and biologics that have been approved for a single rare disease or condition. Further, the legislation subjects drug manufacturers to civil monetary penalties and a potential excise tax for failing to comply with the legislation by offering a price that is not equal to or less than the negotiated "maximum fair price" under the law or for taking price increases that exceed inflation. The legislation also requires manufacturers to pay rebates for drugs in Medicare Part D whose price increases exceed inflation. The new law also caps Medicare out-of-pocket drug costs at an estimated $4,000 a year in 2024 and, thereafter beginning in 2025, at $2,000 a year.

On June 6, 2023, Merck & Co. filed a lawsuit against the HHS and CMS asserting that, among other things, the IRA's Drug Price Negotiation Program for Medicare constitutes an uncompensated taking in violation of the Fifth Amendment of the Constitution. Subsequently, a number of other parties, including the U.S. Chamber of Commerce, or Chamber, Bristol Myers Squibb Company, the Pharmaceutical Research and Manufacturers of America, or PhRMA, Astellas, Novo Nordisk, Janssen Pharmaceuticals, Novartis, AstraZeneca and Boehringer Ingelheim, also filed lawsuits in various courts with similar constitutional claims against the HHS and CMS. We expect that litigation involving these and other provisions of the IRA will continue, with unpredictable and uncertain results.

At the state level, individual states are increasingly aggressive in passing legislation and implementing 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. A number of states, for example, require pharmaceutical manufacturers and other entities in the supply chain, including health carriers, pharmacy benefit managers, wholesale distributors, to disclose information about pricing of pharmaceuticals. In addition, regional healthcare organizations and individual hospitals are increasingly using bidding procedures to determine what pharmaceutical products and which suppliers will be included in their prescription pharmaceutical and other healthcare programs. These measures could reduce the ultimate demand for our products, once approved, or put pressure on our product pricing. 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 products and services, which could result in reduced demand for our product candidates or additional pricing pressures.

Federal and state data privacy laws

There are multiple privacy and data security laws that may impact our business activities, in the United States and in other countries where we conduct trials or where we may do business in the future. These laws are evolving and may increase both our obligations and our regulatory risks in the future. In the health care industry generally, under HIPAA, the HHS has issued regulations to protect the privacy and security of protected health information, or PHI, used or disclosed by covered entities including certain healthcare providers, health plans and healthcare clearinghouses. HIPAA also regulates standardization of data content, codes and formats used in healthcare transactions and standardization of identifiers for health plans and providers. HIPAA also imposes certain obligations on the business associates of covered entities that obtain protected health information in providing services to or on behalf of covered entities. HIPAA may apply to us in certain circumstances and may also apply to our business partners in ways that may impact our relationships with them. Our clinical trials are regulated by the Common Rule, which also includes specific privacy-related provisions. In addition to federal privacy regulations, there are a number of state laws governing confidentiality and security of health information that may be applicable to our business. In addition to possible federal civil and criminal penalties for HIPAA violations, state attorneys general are authorized to file civil actions for damages or injunctions in federal courts to enforce HIPAA and seek attorney's fees and costs associated with pursuing federal civil actions. In addition, state attorneys general (along with private plaintiffs) have brought civil actions seeking injunctions and damages resulting from alleged violations of HIPAA's privacy and security rules. State attorneys general also have authority to enforce state privacy and security laws. New laws and regulations governing privacy and security may be adopted in the future as well.

At the state level, California has enacted legislation that has been dubbed the first "GDPR-like" law in the United States. Known as the California Consumer Privacy Act, or CCPA, it creates new individual privacy rights for consumers (as that word is broadly defined in the law) and places increased privacy and security obligations on entities handling personal data of consumers or households. The CCPA went into effect on January 1, 2020 and requires covered companies to provide new disclosures to California consumers, provide such consumers new ways to opt-out of certain sales of personal information, and allow for a new cause of action for data breaches. Additionally, effective starting on January 1, 2023, the California Privacy Rights Act, or CPRA, significantly modified the CCPA, including by expanding consumers' rights with respect to certain sensitive personal information. The CPRA also creates a new state agency that will be vested with authority to implement and enforce the CCPA and the CPRA. The CCPA and CPRA could impact our business activities depending on how it is interpreted and exemplifies the vulnerability of our business to not only cyber threats but also the evolving regulatory environment related to personal data and individually identifiable health information. These provisions may apply to some of our business activities.

In addition to California, eleven other states have passed comprehensive privacy laws similar to the CCPA and CPRA. These laws are either in effect or will go into effect sometime before the end of 2026. Like the CCPA and CPRA, these laws create obligations related to the processing of personal information, as well as special obligations for the processing of "sensitive" data, which includes health data in some cases. Some of the provisions of these laws may apply to our business activities. There are also states that are strongly considering or have already passed comprehensive privacy laws during the 2024 legislative sessions that will go into effect in 2025 and beyond. Other states will be considering similar laws in the future, and Congress has also been debating passing a federal privacy law. There are also states that are specifically regulating health information that may affect our business. For example, the State of Washington passed the My Health My Data Act in 2023, which specifically regulated health information that is not otherwise regulated by the HIPAA rules, and the law also has a private right of action, which further increases the relevant compliance risk. Connecticut and Nevada have also passed similar laws regulating consumer health data, and more states are considering such legislation in 2024. These laws may impact our business activities, including our identification of research subjects, relationships with business partners and ultimately the marketing and distribution of our products, if approved.

Because of the breadth of these laws and the narrowness of the statutory exceptions and regulatory safe harbors available under such laws, it is possible that some of our current or future business activities, including certain clinical research, sales and marketing practices and the provision of certain items and services to our customers, could be subject to challenge under one or more of such privacy and data security laws. The heightening compliance environment and the need to build and maintain robust and secure systems to comply with different privacy compliance and/or reporting requirements in multiple jurisdictions could increase the possibility that a healthcare company may fail to comply fully with one or more of these requirements. If our operations are found to be in violation of any of the privacy or data security laws or regulations described above that are applicable to us, or any other laws that apply to us, we may be subject to penalties, including potentially significant criminal, civil and administrative penalties, damages, fines, contractual damages, reputational harm, diminished profits and future earnings, additional reporting requirements and/or oversight if we become subject to a consent decree or similar agreement to resolve allegations of non-compliance with these laws, and the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our results of operations. To the extent that any product candidates we may develop, once approved, are sold in a foreign country, we may be subject to similar foreign laws.

Approval and regulation of medical products in the European Union

In addition to regulations in the United States, we will be subject to a variety of foreign regulations governing clinical trials and commercial sales and distribution of our products outside of the United States. Whether or not we obtain FDA approval for a product candidate, we must obtain approval by the comparable regulatory authorities of foreign countries or economic areas, such as the 27-member European Union, before we may commence clinical trials or market products in those countries or areas. In the European Union, our product candidates also may be subject to extensive regulatory requirements. As in the United States, medicinal products can be marketed only if a marketing authorization from the competent regulatory agencies has been obtained. Similar to the United States, the various phases of preclinical and clinical research in the European Union are subject to significant regulatory controls.

With the exception of the European Union and European Economic Area, or EEA, applying the harmonized regulatory rules for medicinal products, the approval process and requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement vary greatly between countries and jurisdictions and can involve additional 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.

Non-clinical studies

Non-clinical studies are performed to demonstrate the health or environmental safety of new chemical or biological substances. Non-clinical (pharmaco-toxicological) studies must be conducted in compliance with the principles of good laboratory practice (GLP) as set forth in EU Directive 2004/10/EC (unless otherwise justified for certain particular medicinal products – e.g., radio-pharmaceutical precursors for radio-labeling purposes). 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

On January 31, 2022, the new Clinical Trials Regulation (EU) No 536/2014, or the CTR, became effective in the European Union and replaced the prior Clinical Trials Directive 2001/20/EC. The new regulation aims at simplifying and streamlining the authorization, conduct and transparency of clinical trials in the European Union. Under the new coordinated procedure for the approval of clinical trials, the sponsor of a clinical trial to be conducted in more than one Member State of the European Union, or EU Member State, will only be required to submit a single application for approval. The submission will be made through the Clinical Trials Information System, a new clinical trials portal overseen by the EMA and available to clinical trial sponsors, competent authorities of the EU Member States and the public.

Beyond streamlining the process, the CTR includes a single set of documents to be prepared and submitted for the application as well as simplified reporting procedures for clinical trial sponsors, and a harmonized procedure for the assessment of applications for clinical trials, which is divided into two parts. Part I is assessed by the competent authorities of all EU Member States in which an application for authorization of a clinical trial has been submitted where EU Member States are concerned. Part II is assessed separately by each EU Member State concerned. Strict deadlines have been established for the assessment of clinical trial applications. The role of the relevant ethics committees in the assessment procedure will continue to be governed by the national law of the concerned EU Member State. However, overall related timelines will be defined by the Clinical Trials Regulation.

The CTR did not change the preexisting requirement that a sponsor must obtain prior approval from the competent national authority of the EU Member State in which the clinical trial is to be conducted. If the clinical trial is conducted in different EU Member States, the competent authorities in each of these EU Member States must provide their approval for the conduct of the clinical trial. Furthermore, the sponsor may only start a clinical trial at a specific clinical site after the applicable ethics committee has issued a favorable opinion.

The CTR foresees a three-year transition period. The extent to which ongoing and new clinical trials will be governed by the CTR varies. Clinical trials for which an application was submitted (i) prior to January 31, 2022 under the Clinical Trials Directive, or (ii) between January 31, 2022 and January 31, 2023 and for which the sponsor has opted for the application of the Clinical Trials Directive remain governed by said Directive until January 31, 2025. After this date, all clinical trials (including those which are ongoing) will become subject to the provisions of the CTR.

Parties conducting certain clinical trials must, as in the United States, post clinical trial information in the European Union at the EU Clinical Trials Registry.

Marketing authorization in the European Union

Marketing authorization applications, or MAAs, can be filed either under the so-called centralized or national authorization procedures, albeit through the mutual recognition or decentralized procedure for a product to be authorized in more than one EU Member State.

The centralized procedure provides for the grant of a single marketing authorization, or MA, following a favorable opinion by the European Medicines Agency, or EMA, that is valid in all EU Member States, as well as Iceland, Liechtenstein and Norway, which are part of the EEA. The centralized procedure is compulsory for medicines produced by specified biotechnological processes, products designated as orphan medicinal products, advanced-therapy medicines (such as gene-therapy, somatic cell-therapy or tissue-engineered medicines) and products with a new active substance indicated for the treatment of specified

diseases, such as HIV/ AIDS, cancer, diabetes, neurodegenerative disorders or autoimmune diseases and other immune dysfunctions and viral diseases. The centralized procedure is optional for products that represent a significant therapeutic, scientific or technical innovation, or whose authorization would be in the interest of public health. Under the centralized procedure the maximum timeframe for the evaluation of an MAA by the EMA is 210 days, excluding clock stops, when additional written or oral information is to be provided by the sponsor in response to questions asked by the Committee for Medicinal Products for Human Use, or the CHMP. Accelerated assessment might be granted by the CHMP in exceptional cases, when a medicinal product is expected to be of a major public health interest, particularly from the point of view of therapeutic innovation. The timeframe for the evaluation of an MAA under the accelerated assessment procedure is of 150 days, excluding stop-clocks.

There are also two other possible routes to authorize medicinal products in several EU countries, which are available for investigational medicinal products that fall outside the scope of the centralized procedure:

- *Decentralized procedure*. Using the decentralized procedure, a sponsor may apply for simultaneous authorization in more than one EU country of medicinal products that have not yet been authorized in any EU country and that do not fall within the mandatory scope of the centralized procedure. The sponsor may choose a member state as the reference member State to lead the scientific evaluation of the application.

- *Mutual recognition procedure*. In the mutual recognition procedure, a medicine is first authorized in one EU Member State (which acts as the reference member state), in accordance with the national procedures of that country. Following this, further marketing authorizations can be progressively sought from other EU countries in a procedure whereby the countries concerned agree to recognize the validity of the original, national marketing authorization produced by the reference member state.

Under the above-described procedures, before granting the marketing authorization, the EMA or the competent authorities of the Member States of the EEA make an assessment of the risk-benefit balance of the product on the basis of scientific criteria concerning its quality, safety and efficacy.

Conditional approval

In particular circumstances, EU legislation (Article 14–a Regulation (EC) No 726/2004 (as amended by Regulation (EU) 2019/5 and Regulation (EC) No 507/2006 on Conditional Marketing Authorizations for Medicinal Products for Human Use) enables sponsors to obtain a conditional MA prior to obtaining the comprehensive clinical data required for an application for a full MA. Such conditional approvals may be granted for product candidates (including medicines designated as orphan medicinal products) if (1) the product candidate is intended for the treatment, prevention or medical diagnosis of seriously debilitating or life-threatening diseases; (2) the product candidate is intended to meet unmet medical needs of patients; (3) an MA may be granted prior to submission of comprehensive clinical data provided that the benefit of the immediate availability on the market of the medicinal product concerned outweighs the risk inherent in the fact that additional data are still required; (4) the risk-benefit balance of the product candidate is positive, and (5) it is likely that the sponsor will be in a position to provide the required comprehensive clinical trial data. A conditional MA may contain specific obligations to be fulfilled by the MA holder, including obligations with respect to the completion of ongoing or new clinical trials and with respect to the collection of pharmacovigilance data. Conditional MAs are valid for one year, and may be renewed annually, if the risk-benefit balance remains positive, and after an assessment of the need for additional or modified conditions or specific obligations. The timelines for the centralized procedure described above also apply with respect to the review by the CHMP of applications for a conditional MA.

Exceptional Circumstances

A MA may also be granted "under exceptional circumstances" when the applicant can show that it is unable to provide comprehensive data on the efficacy and safety under normal conditions of use even after the product has been authorized and subject to specific procedures being introduced. This may arise in particular when the intended indications are very rare and, in the present state of scientific knowledge, it is not possible to provide comprehensive information, or when generating data may be contrary to generally accepted ethical principles. This MA is close to the conditional MA as it is reserved to medicinal products to be approved for severe diseases or unmet medical needs and the applicant does not hold the complete data set legally required for the grant of a MA. However, unlike the conditional MA, the applicant does not have to provide the missing data and will never have to. Although the MA "under exceptional circumstances" is granted definitively, the risk-benefit balance of the medicinal product is reviewed annually, and the MA is withdrawn in case the risk-benefit ratio is no longer favorable. Under these procedures, before granting the MA, the EMA or the competent authorities of the 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. Other than with respect to conditional MAs, MAs have an initial duration of five years. After these five years, the authorization may be renewed on the basis of a reevaluation of the risk-benefit balance.

Pediatric trials

Prior to obtaining a marketing authorization in the European Union, sponsors have to demonstrate compliance with all measures included in an EMA-approved Pediatric Investigation Plan, or PIP, covering all subsets of the pediatric population, unless the EMA has granted a product-specific waiver, a class waiver or a deferral for one or more of the measures included in the PIP. The respective requirements for all marketing authorization procedures are set forth in Regulation (EC) No 1901/2006, which is referred to as the Pediatric Regulation. This requirement also applies when a company wants to add a new indication, pharmaceutical form or route of administration for a medicine that is already authorized. The Pediatric Committee of the EMA, or PDCO, may grant deferrals for some medicines, allowing a company to delay development of the medicine in children until there is enough information to demonstrate its effectiveness and safety in adults. The PDCO may also grant waivers when development of a medicine in children is not needed or is not appropriate because (a) the product is likely to be ineffective or unsafe in part or all of the pediatric population; (b) the disease or condition occurs only in adult population; or (c) the product does not represent a significant therapeutic benefit over existing treatments for pediatric population. Before a marketing authorization application can be filed, or an existing marketing authorization can be amended, the EMA determines that companies actually comply with the agreed studies and measures listed in each relevant PIP.

PRIME designation

In March 2016, the EMA launched an initiative to facilitate development of product candidates in indications, often rare, for which few or no therapies currently exist. The PRIority MEdicines, or PRIME, scheme is intended to encourage product development in areas of unmet medical need and provides accelerated assessment of products representing substantial innovation reviewed under the centralized procedure. Products from small- and medium-sized enterprises, or SMEs, may qualify for earlier entry into the PRIME scheme than larger companies. Many benefits accrue to sponsors of product candidates with PRIME designation, including but not limited to, early and proactive regulatory dialogue with the EMA, frequent discussions on clinical trial designs and other development program elements, and accelerated marketing authorization application assessment once a dossier has been submitted. Importantly, a dedicated agency contact and rapporteur from the CHMP or Committee for Advanced Therapies are appointed early in the PRIME scheme, facilitating increased understanding of the product at EMA's Committee level. A kick-off meeting initiates these relationships and includes a team of multidisciplinary experts at the EMA to provide guidance to the sponsor on the overall development and regulatory strategies.

Periods of authorization and renewals

A marketing authorization is valid for five years in principle and the marketing authorization may be renewed after five years on the basis of a re-evaluation of the risk-benefit balance by the EMA or by the competent authority of the authorizing member state. To this end, the marketing authorization holder must provide the EMA or the competent authority with a consolidated version of the file in respect of quality, safety and efficacy, including all variations introduced since the marketing authorization was granted, at least nine months before the marketing authorization ceases to be valid. Once renewed, the marketing authorization is valid for an unlimited period, unless the European Commission or the competent authority decides, on justified grounds relating to pharmacovigilance, to proceed with one additional five-year renewal. Any authorization which is not followed by the actual placing of the product on the EU market (in case of centralized procedure) or on the market of the authorizing member state within three years after authorization ceases to be valid (the so-called sunset clause).

Regulatory requirements after marketing authorization

As in the United States, both marketing authorization holders and manufacturers of medicinal products are subject to comprehensive regulatory oversight by the EMA and the competent authorities of the individual EU Member States both before and after grant of the manufacturing and marketing authorizations. The holder of an EU marketing authorization for a medicinal product must, for example, comply with EU pharmacovigilance legislation and its related regulations and guidelines which entail many requirements for conducting pharmacovigilance, or the assessment and monitoring of the safety of medicinal products. The manufacturing process for medicinal products in the European Union is also highly regulated and regulators may shut down manufacturing facilities that they believe do not comply with regulations. Manufacturing requires a manufacturing authorization, and the manufacturing authorization holder must comply with various requirements set out in the applicable EU laws, including compliance with EU cGMP standards when manufacturing medicinal products and active pharmaceutical ingredients.

In the European Union, the advertising and promotion of approved products are subject to EU Member States' laws governing promotion of medicinal products, interactions with clinicians, misleading and comparative advertising and unfair commercial practices. In addition, other legislation adopted by individual EU Member States may apply to the advertising and promotion of medicinal products. These laws require that promotional materials and advertising in relation to medicinal products comply with the product's Summary of Product Characteristics, or SmPC, as approved by the competent authorities. Promotion of a medicinal product that does not comply with the SmPC is considered to constitute off-label promotion, which is prohibited in the European Union.

Regulatory exclusivity

In the European Union, new products authorized for marketing (i.e., reference products) qualify for eight years of data exclusivity and an additional two years of market exclusivity upon marketing authorization. The data exclusivity period prevents generic sponsors from relying on the preclinical and clinical trial data contained in the dossier of the reference product when applying for a generic marketing authorization in the European Union during a period of eight years from the date on which the reference product was first authorized in the European Union. The market exclusivity period prevents a successful generic sponsor from commercializing its product in the European Union until ten years have elapsed from the initial authorization of the reference product in the European Union. The ten-year market exclusivity period can be extended to a maximum of eleven years if, during the first eight years of those ten years, the marketing authorization 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.

Orphan drug designation and exclusivity

The criteria for designating an orphan medicinal product in the European Union are similar in principle to those in the United States. Under Article 3 of Regulation (EC) 141/2000, a medicinal product may be designated as orphan if (1) it is intended for the diagnosis, prevention or treatment of a life- threatening or chronically debilitating condition, (2) either (a) such condition affects no more than five in 10,000 persons in the European Union when the application is made, or (b) the product, without the benefits derived from orphan status, would not generate sufficient return in the European Union to justify investment and (3) there exists no satisfactory method of diagnosis, prevention or treatment of such condition authorized for marketing in the European Union, or if such a method exists, the product will be of significant benefit to those affected by the condition. The term 'significant benefit' is defined in Regulation (EC) 847/2000 to mean a clinically relevant advantage or a major contribution to patient care.

Orphan medicinal products are eligible for financial incentives such as reduction of fees or fee waivers and are, upon grant of a marketing authorization, entitled to ten years of market exclusivity for the approved therapeutic indication. During this ten year market exclusivity period, the EMA or the competent authorities of the Member States of the EEA, cannot accept an application for a marketing authorization for a similar medicinal product for the same indication. A similar medicinal product is defined as a medicinal product containing a similar active substance or substances as contained in an authorized orphan medicinal product, and which is intended for the same therapeutic indication. The application for orphan designation must be submitted before the application for marketing authorization. The sponsor will receive a fee reduction for the marketing authorization application if the orphan designation has been granted, but not if the designation is still pending at the time the marketing authorization is submitted. Orphan designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process.

The ten-year market exclusivity in the European Union may be reduced to six years if, at the end of the fifth year, it is established that the product no longer meets the criteria for orphan designation, for example, if the product is sufficiently profitable not to justify maintenance of market exclusivity. Additionally, marketing authorization may be granted to a similar product for the same indication at any time if: (1) the second sponsor can establish that its product, although similar, is safer, more effective or otherwise clinically superior; (2) the sponsor consents to a second orphan medicinal product application; or (3) the sponsor cannot supply enough orphan medicinal product.

Pediatric exclusivity

If a sponsor obtains a marketing authorization in all EU Member States, or a marketing authorization granted in the centralized procedure by the European Commission, and the trial results for the pediatric population are included in the product information, even when negative, the medicine is then eligible for an additional six-month period of qualifying patent protection through extension of the term of the Supplementary Protection Certificate, or SPC, or alternatively a one year extension of the regulatory market exclusivity from ten to eleven years, as selected by the marketing authorization holder.

Patent term extensions

The European Union also provides for patent term extension through Supplementary Protection Certificates, or SPCs. The rules and requirements for obtaining a SPC are similar to those in the United States. An SPC may extend the term of a patent for up to five years after its originally scheduled expiration date and can provide up to a maximum of fifteen years of marketing exclusivity for a product. In certain circumstances, these periods may be extended for six additional months if pediatric exclusivity is obtained. Although SPCs are available throughout the European Union, sponsors must apply on a country-by-country basis. Similar patent term extension rights exist in certain other foreign jurisdictions outside the European Union.

Reimbursement and pricing of prescription pharmaceuticals

In the European Union, pricing and reimbursement schemes vary widely from country to country. Some countries provide that products may be marketed only after a reimbursement price has been agreed. Some countries may require the completion of additional studies that compare the cost-effectiveness of a particular product candidate to currently available therapies or so-called health technology assessments, in order to obtain reimbursement or pricing approval. For example, the European Union provides options for EU Member States to restrict the range of products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. EU Member States may approve a specific price for a product, or it may instead adopt a system of direct or indirect controls on the profitability of the company placing the product on the market. Other EU Member States allow companies to fix their own prices for products but monitor and control prescription volumes and issue guidance to physicians to limit prescriptions. Recently, many countries in the European Union have increased the amount of discounts required on pharmaceuticals and these efforts could continue as countries attempt to manage health care expenditures, especially in light of the severe fiscal and debt crises experienced by many countries in the European Union. The downward pressure on health care costs in general, particularly prescription products, has become intense. As a result, increasingly high barriers are being erected to the entry of new products. Political, economic and regulatory developments may further complicate pricing negotiations, and pricing negotiations may continue after reimbursement has been obtained. Reference pricing used by various Member States, and parallel trade, i.e., arbitrage between low-priced and high-priced EU Member States, can further reduce prices. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any products, if approved in those countries.

Approval of companion diagnostic devices

In the European Union, medical devices such as companion diagnostics must comply with the General Safety and Performance Requirements, or SPRs, detailed in Annex I of the EU Medical Devices Regulation (Regulation (EU) 2017/745), or MDR which came into force on May 26, 2021 and replaced the previously applicable EU Medical Devices Directive (Council Directive 93/42/EEC). Compliance with SPRs and additional requirements applicable to companion medical devices is a prerequisite to be able to affix the CE Mark of Conformity to medical devices, without which they cannot be marketed or sold. To demonstrate compliance with the SPRs, a manufacturer must undergo a conformity assessment procedure, which varies according to the type of medical device and its classification. The MDR is meant to establish a uniform, transparent, predictable, and sustainable regulatory framework across the European Union for medical devices.

Separately, the regulatory authorities in the European Union also adopted a new In Vitro Diagnostic Regulation, or IVDR, (EU) 2017/746, which became effective in May 2022. The new regulation replaces the In Vitro Diagnostics Directive (IVDD) 98/79/EC. Manufacturers wishing to apply to a notified body for a conformity assessment of their in vitro diagnostic medical device had until May 2022 to update their Technical Documentation to meet the requirements and comply with the new, more stringent Regulation. The regulation, among other things, strengthens the rules on placing devices on the market and reinforce surveillance once they are available; establishes explicit provisions on manufacturers' responsibilities for the follow-up of the quality, performance, and safety of devices placed on the market; improves the traceability of medical devices throughout the supply chain to the end-user or patient through a unique identification number; sets up a central database to provide patients, healthcare professionals and the public with comprehensive information on products available in the European Union; and strengthens rules for the assessment of certain high-risk devices, such as implants, which may have to undergo an additional check by experts before they are placed on the market.

The IVDR became effective in May 2022. However, it became clear in 2021that that EU Member States, health institutions and economic operators were not ready to apply the IVDR as from that date. The European Commission therefore proposed a progressive or staggered roll-out of the rules of the IVDR. The current transition periods range from May 26, 2025 for high risk In Vitro Diagnostics, or IVDs, to May 26, 2027 for lower risk IVDs. Certain provisions for devices manufactured and used in health institutions, would have to apply as from May 26, 2028. These transition periods only apply to so called "legacy

devices," meaning devices covered by a certificate or declaration of conformity issued under the previous legal framework (notably the IVDD).

General Data Protection Regulation

There are significant privacy and data security laws that apply in Europe and other countries. The collection, use, disclosure, transfer, or other processing of personal data, including personal health data, regarding individuals who are located in the EEA, and the processing of personal data that takes place in the EEA, is subject to the European Union's General Data Protection Regulation, or GDPR, which became effective on May 25, 2018. The GDPR is wide-ranging in scope and imposes numerous requirements on companies that process personal data, and it imposes heightened requirements on companies that process health and other sensitive data, such as requiring in many situations that a company obtain the consent of the individuals to whom the sensitive personal data relate before processing such data. Examples of obligations imposed by the GDPR on companies processing personal data that fall within the scope of the GDPR include providing information to individuals regarding data processing activities, implementing safeguards to protect the security and confidentiality of personal data, appointing a data protection officer, providing notification of data breaches and taking certain measures when engaging third-party processors.

The GDPR also imposes strict rules on the transfer of personal data to countries outside the EEA, including the United States, and permits data protection authorities to impose large penalties for violations of the GDPR, including potential fines of up to €20 million or 4% of annual global revenues, whichever is greater. The GDPR also confers a private right of action on data subjects and consumer associations to lodge complaints with supervisory authorities, seek judicial remedies, and obtain compensation for damages resulting from violations of the GDPR. Compliance with the GDPR is a rigorous and time-intensive process that may increase the cost of doing business or require companies to change their business practices to ensure full compliance.

In July 2020, the Court of Justice of the European Union, or the CJEU, invalidated the EU-U.S. Privacy Shield framework, one of the mechanisms used to legitimize the transfer of personal data from the EEA to the United States. Following CJEU decision, in October 2022, President Biden signed an executive order to implement the EU-U.S. Data Privacy Framework, which would serve as a replacement to the EU-US Privacy Shield. The European Union initiated the process to adopt an adequacy decision for the EU-U.S. Data Privacy Framework in December 2022, and the European Commission adopted the adequacy decision in July 2023. The adequacy decision permits United States companies who self-certify to the EU-U.S. Data Privacy Framework to rely on it as a valid data transfer mechanism for data transfers from the European Union to the United States. However, some privacy advocacy groups have already suggested that they will be challenging the EU-U.S. Data Privacy Framework. If these challenges are successful, they may not only impact the EU-U.S. Data Privacy Framework, but also further limit the viability of the standard contractual clauses and other data transfer mechanisms. The uncertainty around this issue has the potential to impact our business.

On June 23, 2016, the electorate in the United Kingdom voted in favor of leaving the European Union, commonly referred to as Brexit. Following the withdrawal of the United Kingdom from the European Union, the U.K. Data Protection Act 2018 applies to the processing of personal data that takes place in the United Kingdom and includes parallel obligations to those set forth by GDPR. While the Data Protection Act of 2018 in the United Kingdom that "implements" and complements the GDPR has achieved Royal Assent on May 23, 2018 and is now effective in the United Kingdom, it is unclear whether transfer of data from the EEA to the United Kingdom will remain lawful under the GDPR, although these transfers currently are permitted by an adequacy decision from the European Commission. The United Kingdom government has already determined that it considers all European Union 27 and EEA member states to be adequate for the purposes of data protection, ensuring that data flows from the United Kingdom to the EU/EEA remain unaffected. In addition, a recent decision from the European Commission appears to deem the United Kingdom as being "essentially adequate" for purposes of data transfer from the European Union to the United Kingdom, although this decision may be re-evaluated in the future. The United Kingdom and the United States have also agreed to a U.S.-UK "Data Bridge," which functions similarly to the EU-U.S. Data Privacy Framework and provides an additional legal mechanism for companies to transfer data from the United Kingdom to the United States. In addition to the United Kingdom, Switzerland is also in the process of approving an adequacy decision in relation to the Swiss-U.S. Data Privacy Framework (which would function similarly to the EU-U.S. Data Privacy Framework and the U.S.-UK Data Bridge in relation to data transfers from Switzerland to the United States). Any changes or updates to these developments have the potential to impact our business.

Brexit and the regulatory framework in the United Kingdom

The United Kingdom's withdrawal from the European Union took place on January 31, 2020. The European Union and the United Kingdom reached an agreement on their new partnership in the Trade and Cooperation Agreement, or the Agreement, which was applied provisionally beginning on January 1, 2021 and which became effective on May 1, 2021. The Agreement focuses primarily on free trade by ensuring no tariffs or quotas on trade in goods, including healthcare products such as medicinal products. Thereafter, the European Union and the United Kingdom will form two separate markets governed by two distinct regulatory and legal regimes. As such, the Agreement seeks to minimize barriers to trade in goods while accepting that border checks will become inevitable as a consequence that the United Kingdom is no longer part of the single market. As of January 1, 2021, the Medicines and Healthcare products Regulatory Agency, or the MHRA, became responsible for supervising medicines and medical devices in Great Britain, comprising England, Scotland and Wales under domestic law whereas Northern Ireland continues to be subject to EU rules under the Northern Ireland Protocol.

On February 27, 2023, the United Kingdom government and the European Commission announced a political agreement in principle to replace the Northern Ireland Protocol with a new set of arrangements, known as the "Windsor Framework". This new framework fundamentally changes the existing system under the Northern Ireland Protocol, including with respect to the regulation of medicinal products in the UK In particular, the MHRA will be responsible for approving all medicinal products destined for the United Kingdom market (i.e., Great Britain and Northern Ireland), and the EMA will no longer have any role in approving medicinal products destined for Northern Ireland. A single United Kingdom-wide MA will be granted by the MHRA for all medicinal products to be sold in the United Kingdom, enabling products to be sold in a single pack and under a single authorization throughout the United Kingdom. The Windsor Framework was approved by the EU-UK Joint Committee on March 24, 2023, so the United Kingdom government and the European Union will enact legislative measures to bring it into law. On June 9, 2023, the MHRA announced that the medicines aspects of the Windsor Framework will apply from January 1, 2025. The Human Medicines Regulations 2012 (SI 2012/1916) (as amended), or the HMR, is the primary legal instrument for the regulation of medicines in the United Kingdom The HMR has incorporated into the domestic law the body of EU law instruments governing medicinal products that pre-existed prior to the United Kingdom's withdrawal from the European Union.

European laws that have been transposed into United Kingdom law through secondary legislation continue to be applicable as "retained EU law." However, new legislation such as the CTR will not be applicable in Great Britain. Since a significant proportion of the regulatory framework for pharmaceutical products in the United Kingdom covering the quality, safety and efficacy of pharmaceutical products, clinical trials, MAs, commercial sales and distribution of pharmaceutical products is derived from European Union directives and regulations, Brexit may have a material impact upon the regulatory regime with respect to the development, manufacture, importation, approval, and commercialization of our product candidates in the United Kingdom. For example, the United Kingdom is no longer covered by the centralized procedures for obtaining EU-wide MAs from the EMA, and a separate MA will be required to market any of our product candidates, if approved, in the United Kingdom. A new international recognition framework has been in place since January 1, 2024, whereby the MHRA will have regard to decisions on the approval of MAs made by the EMA and certain other regulators when determining an application for a new Great Britain MA.

Intellectual property

We actively seek to protect the proprietary technology that we consider important to our business, including pursuing patents that cover our ADC platforms, proprietary compositions of matter, ADC product candidates and methods of using and manufacturing the same, as well as any other relevant inventions and improvements that are considered commercially important to the development of our business. We also rely on trade secrets and confidential information, know-how and continuing technological innovation to develop and maintain our proprietary and intellectual property position.

Our commercial success will depend significantly on our ability to obtain and maintain patents and other proprietary protection for the technology, inventions and improvements we consider important to our business; to defend our patents; to preserve the confidentiality of our trade secrets and other know-how and to operate without infringing the patents and proprietary rights of third parties. Our policy is to seek to protect our proprietary and intellectual property position by, among other methods, filing U.S., international (under Patent Cooperation Treaty, or PCT) and foreign patent applications related to our proprietary technology, inventions and improvements that we consider to be important to the development and implementation of our business. We also believe in protecting our unpatented trade secrets and know-how and continuing our technological innovation to develop our business and to maintain our competitive position.

The term of individual patents depends upon the legal term for patents in the countries in which they are obtained. In most countries, including the United States, the patent term is 20 years from the earliest filing date of a non-provisional patent application. In the United States, a patent's term may be lengthened by patent term adjustment, which compensates a patentee for administrative delays by the USPTO in examining and granting a patent or may be shortened if a patent is terminally disclaimed over an earlier filed patent. The term of a patent that covers a drug or biological product may also be eligible for patent term extension when FDA approval is granted, provided statutory and regulatory requirements are met. In the future, if and when our drug candidates receive approval by the FDA or foreign regulatory authorities, we expect to apply for patent term extensions, where available, on issued patents covering those drugs, depending upon, for example, the length of the clinical trials for each drug and other factors. There can be no assurance that any of our pending patent applications will issue or that we will benefit from any patent term extension or favorable adjustments to the terms of any of our patents.

As with other biotechnology and pharmaceutical companies, our ability to maintain and solidify our proprietary and intellectual property position for our drug candidates and technologies will depend on our success in obtaining effective patent claims and enforcing those claims if granted. However, our pending patent applications, and any patent applications that we may in the future file or license from third parties, may not result in the issuance of patents. We also cannot predict the breadth of claims that may be allowed or enforced in our patents. Any issued patents that we may currently own or license or may receive in the future may be challenged, invalidated, circumvented or have the scope of their claims narrowed. For example, we cannot be certain of the priority of inventions covered by pending third party patent applications. If third parties prepare and file patent applications in the United States that also claim technology or therapeutics to which we have rights, we may have to participate in interference proceedings in the USPTO to determine priority of invention, which could result in substantial costs to us, even if the eventual outcome is favorable to us, which is highly unpredictable. In addition, because of the extensive time required for clinical development and regulatory review of a drug candidate we may develop, it is possible that, before any of our drug candidates can be commercialized, any related patent may expire or remain in force for only a short period following commercialization, thereby limiting the protection such patent would afford the respective product and any competitive advantage such patent may provide. For more information regarding the risks related to our intellectual property, please see "Risk factors—Risks related to our intellectual property."

We seek to protect certain inventions arising from our research and development through the filing, prosecution and maintenance of U.S. and foreign patent applications. The geographic filing scope of any particular patent application will be dependent upon a number of factors, including without limitation, the expected applicability of the invention to our novel platforms and product candidates being researched and developed. For inventions that relate to our novel Dolasynthen platform and related product candidates and our novel Immunosynthen platform and related product candidates, we seek patent protection in countries including the United States, Europe, Australia, Canada, China, Japan, South Korea and may also seek protection in additional foreign jurisdictions. Aspects of our patent portfolio relating to our Dolasynthen and Immunosynthen platforms and product candidates are described in more detail below. We have also non-exclusively in-licensed from Synaffix certain patents and patent applications relating to its site-specific conjugation technology. These in-licensed Synaffix patents and patent applications include eight issued US patents, three pending non-provisional U.S. patent applications, thirteen issued foreign patents, and 14 pending foreign patent applications, in a number of foreign jurisdictions, including, but not limited to, China, Europe, India, Japan, and Netherlands. The in-licensed patents are projected to expire from 2031 to 2040, excluding any additional term for patent term adjustments or patent term extensions. We have so far not filed for patent protection in all national and regional jurisdictions where such protection may be available. In addition, we may decide to abandon national and regional patent applications before they are granted. Finally, the grant proceeding of each national or regional patent is an independent proceeding which may lead to situations in which applications might in some jurisdictions be refused by the relevant registration authorities, while granted by others. It is also quite common that depending on the country, various scopes of patent protection may be granted on the same product candidate or technology.

The intellectual property portfolio relating to our Dolasynthen and Immunosynthen ADC platforms and our product candidates and components and uses thereof are summarized below. Some of these portfolios are in very early stages, and prosecution has yet to commence on some of the pending patent applications. Prosecution is a lengthy process, during which the scope of the claims initially submitted for examination by the USPTO may be narrowed (sometimes significantly) by the time they issue, if they issue at all. We expect this to be the case with respect to our pending patent applications referred to below.

Dolasynthen platform

The intellectual property portfolio for our novel Dolasynthen platform is directed to compositions of matter for the novel auristatin payload, the novel scaffold and ADCs thereof, as well as methods of using and making these novel compositions of matter. With respect to the intellectual property relating to our Dolasynthen platform, as of December 31, 2023, we owned five issued U.S. patents (expiring in 2032 (compositions of matter), 2037 (compositions of matter) and 2041 (compositions of matter and methods of use and manufacture), excluding any additional term for patent term adjustments or patent term extensions), twenty-nine issued foreign patents (including patents issued in Australia, Canada, China, Europe, Japan and South Korea) expiring in 2032 (compositions of matter) and 2037 (compositions of matter and compositions for use), excluding any additional term for patent term adjustments or patent term extensions), and applications pending in the United States and a number of foreign jurisdictions within four patent families. Any U.S. or foreign patent issuing from the pending applications relating to the novel Dolasynthen platform is projected to expire between 2032 and 2041, excluding any additional term for patent term adjustments or patent term extensions.

XMT-1660

The intellectual property portfolio for XMT-1660, our site-specific B7-H4 ADC product candidate, is directed to compositions of matter relating to our novel ADC based on our novel B7-H4 antibody and our Dolasynthen platform, as well as methods of using, making and administering these novel conjugates. With respect to the intellectual property relating to XMT-1660, as of December 31, 2023, we owned one allowed U.S. patent application (projected to expire 2042 (compositions of matter and methods of use), excluding any additional term for patent term adjustments or patent term extensions), and applications pending in the U.S., under the Patent Cooperation Treaty, or PCT, and in a number of foreign jurisdictions within three patent families. Any U.S. or foreign patent issuing from the pending applications relating to XMT-1660 compositions of matter and its methods of use, administration and/or manufacturing is projected to expire between 2042 and 2044, excluding any additional term for patent term adjustments or patent term extensions.

Immunosynthen platform

The intellectual property portfolio for our novel Immunosynthen platform is directed to compositions of matter for the novel STING agonists and ADCs thereof, as well as methods of using and methods of making these novel payloads and ADCs. With respect to the intellectual property relating to our Immunosynthen platform, as of December 31, 2023, we owned one issued U.S. patent (expiring in 2040 (compositions of matter), excluding any additional term for patent term adjustments or patent term extensions) and applications pending in the U.S, and a number of foreign jurisdictions within two patent families. Any U.S. or foreign patent issuing from the pending applications relating to the novel STING agonists and the Immunosynthen ADC platform is projected to expire between 2040 and 2041, excluding any additional term for patent term adjustments or patent term extensions.

XMT-2056

The intellectual property portfolio for XMT-2056, our HER2-targeted novel Immunosynthen ADC, is directed to the compositions of matter for our novel ADC based on our novel HER2 antibody and our Immunosynthen platform, as well as methods of using, making and administering these novel conjugates, including XMT-2056. With respect to the intellectual property relating to XMT-2056, as of December 31, 2023, we owned three issued U.S. patents (expiring in 2035 (compositions of matter and methods of use), excluding any additional term for patent term adjustments or patent term extensions), 34 issued foreign patents (expiring 2035 (compositions of matter, methods of manufacture and compositions for use), excluding any additional term for patent term adjustments or patent term extensions), and applications pending in the U.S., under the PCT, and various foreign jurisdictions within four patent families. Any U.S. or foreign patent issuing from the pending applications relating to the novel HER2-targeted Immunosynthen ADC XMT-2056 is projected to expire between 2035 and 2044, excluding any additional term for patent term adjustments or patent term extensions.

In addition to patents, we rely upon unpatented trade secrets and confidential know-how, inventions, proprietary information and continuing technological innovation to develop and maintain our competitive position. We seek to protect and maintain the confidentiality of our proprietary information, in part, by executing confidentiality and assignment of inventions agreements with our employees and consultants, which agreements may also include appropriate non-competition and non-solicit agreements depending on level and role, as well as confidentiality agreements with our collaborators and scientific advisors. We have also executed agreements requiring assignment of inventions with selected scientific advisors and collaborators. The confidentiality agreements we enter into are designed to protect our proprietary information and the agreements or clauses requiring assignment of inventions to us are designed to grant us ownership of technologies that are developed through our relationship with the respective counterparty. We cannot guarantee, however, that we will have executed such agreements with all applicable employees and contractors, or that these agreements will afford us adequate protection of our intellectual property and proprietary information rights. Trade secrets and proprietary know-how can be difficult to protect. In particular, although we take steps to protect our proprietary information, we anticipate that information relating to our technology platforms, trade secrets and proprietary know-how may over time be disseminated within the industry through independent development and public presentations describing the methodology. For more information regarding the risks associated with our trade secrets, please see "Risk factors—Risks related to our intellectual property—Confidentiality agreements with employees and third parties may not prevent unauthorized disclosure of trade secrets and other proprietary information."

Competition

The biotechnology and biopharmaceutical industries, and the oncology subsector, are characterized by rapid evolution of technologies, fierce competition and strong defense of intellectual property. Any product candidates that we successfully develop and commercialize will have to compete with existing therapies and new therapies that may become available in the future. While we believe that our proprietary ADC platforms and scientific expertise provide us with competitive advantages, a wide variety of institutions, including large biopharmaceutical companies, specialty biotechnology companies, academic research departments and public and private research institutions, are actively developing potentially competitive products and technologies. These competitors generally fall within the following categories:

Developers of new cancer treatments: Many global pharmaceutical companies, as well as medium and small biotechnology companies, are pursuing new cancer treatments, whether small molecules, biologics or ADCs. Any of these treatments could prove to be superior clinically to our products.

Companies with cytotoxic ADC platforms: Many companies are investing in innovation in the ADC field, including new payload classes, new conjugation approaches and new targeting moieties. Any of these initiatives could lead to a platform that has superior properties to the ones we have developed or are developing. We are also aware of multiple companies with ADC technologies that may be competitive to our platforms, including AbbVie Inc.; Ambrx Biopharma, Inc. (which has announced its expected acquisition by Johnson & Johnson); Daiichi Sankyo Company, Limited; Gilead Sciences, Inc.; and Pfizer Inc. These companies or their partners and collaborators, including Astellas Pharma Inc.; AstraZeneca plc; Genentech, a member of the Roche Group; and Takeda, may develop product candidates that compete in the same indications as our current and future product candidates. Multiple companies are also developing ADCs that could compete with our Immunosynthen platform and its resulting product candidates, including Bolt Biotherapeutics, Inc.; Sutro Biopharma, Inc.; and Takeda, albeit with differing immune-stimulating approaches. We expect to compete based on our innovative technology and the efficacy and safety and tolerability profile of our ADCs compared to other product candidates. However, if our ADCs are not demonstrably superior in these respects, we may not be able to compete effectively.

Companies with B7-H4-targeted product candidates: Multiple investigational B7-H4 ADCs are in first-in-human clinical trials, including SGN-B7H4V (Pfizer Inc., acquired from Seagen Inc.), HS-20089/GSK5733584 (GSK plc, licensed from Hansoh Pharmaceutical Group Company Limited) and AZD8205 (AstraZeneca plc), with additional B7-H4 ADCs in preclinical development. Further, there are B7-H4-targeting agents being evaluated in clinical trials that are based on other, non-ADC modalities, including CLN-418 (B7-H4 x 4-1BB BsAb from Cullinan Oncology, Inc.); GEN1047 (B7-H4 x CD3 BsAb from Genmab A/S) and ABL103 (B7-H4 x 4-1BB BsAb from ABL Bio, Inc.). While all of the foregoing programs are currently in Phase 1 or Phase 1/2 clinical trials and are focused on a broad set of solid tumors, many are prioritizing solid tumors known to have high B7-H4 expression, including breast, endometrial and ovarian cancers. Our ability to compete effectively with other B7-H4 programs will depend on our ability to differentiate XMT-1660 from other therapies based on target tumor types, payload, efficacy and tolerability. Any inability to effectively differentiate XMT-1660 from other product candidates targeting B7-H4 would negatively impact our ability to compete.

Companies with STING platforms and product candidates: Among immunostimulatory ADCs currently in clinical trials, the payloads being used fall into two primary categories: STING agonists and toll-like receptor, or TLR, agonists. Additional preclinical and discovery programs include those targeting tumor associated antigens like CD73 and PD-(L)1. Current clinically active immune-stimulating ADCs include Bolt Therapeutics. Inc.'s BDC-1001 (HER2-directed TLR 7/8 agonist) and Takeda's TAK-500 (CCR2-directed STING agonist), both of which are being investigated across numerous solid tumor types. Multiple systemically-administered STING agonist programs are also in the clinic, including both CDN and non-CDN STING agonists. Our ability to compete effectively with products such as these depends on our ability to differentiate XMT-2056 and other potential Immunosynthen ADCs from these other therapies based on target and/or biomarker selection, efficacy and safety and tolerability.

Companies with HER2-targeting ADCs: There are currently two approved HER2-targeting ADCs, Roche AG's KADCYLA® (ado-trastuzumab emtansine), which is approved for the treatment of breast cancer, and AstraZeneca, Inc.'s and Daiichi Sankyo Company Limited's ENHERTU® (fam-trastuzumab deruxtecan-nxki), which is approved for the treatment of breast cancer, NSCLC and gastric cancer. These two approved HER2-targeting ADCs have altered the treatment landscape of their respective indications, particularly in breast cancer. There are also currently over 40 ADCs targeting HER2 in clinical development globally, with variable payloads, linkers and tumor targets. Our ability to compete effectively with these agents will depend on XMT-2056's differentiation from or combinability with these other agents.

Many of our competitors, either alone or with strategic partners, have substantially greater financial, technical and human resources than we do. Accordingly, our competitors may be more successful than us in obtaining approval for treatments and achieving widespread market acceptance, rendering our treatments obsolete or non-competitive. Accelerated merger and acquisition activity in the biotechnology and biopharmaceutical industries may result in even more resources being concentrated among a smaller number of our competitors. These companies also compete with us in recruiting and retaining qualified scientific and management personnel, establishing clinical trial sites and patient enrollment for clinical trials and acquiring technologies complementary to, or necessary for, our programs. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. Our commercial opportunity could be substantially limited in the event that our competitors develop and commercialize products that are more effective, safer, more convenient or less expensive than our comparable products. In geographies that are critical to our commercial success, competitors may also obtain regulatory approvals before us, resulting in our competitors building a strong market position in advance of our products' entry. We believe the factors determining the success of our programs will be the efficacy, safety and tolerability of our product candidates.

Employees and Human Capital

As of December 31, 2023, we had 123 full time employees, including 83 with M.D., Ph.D. or other advanced degrees. Of these employees, 84 are engaged in research and development and 39 are engaged in general and administrative activities. None of our employees are represented by a labor union or covered by a collective bargaining agreement. We consider our relationship with our employees to be good.

We believe that our future success largely depends upon our continued ability to attract and retain highly skilled employees. Our human capital objectives include, as applicable, identifying, recruiting, retaining, incentivizing and integrating our existing and additional employees, and focusing on employee well-being and workplace safety. We provide our employees with competitive salaries and bonuses, opportunity for equity ownership, development programs that enable continued learning and growth, and a robust employment package that promotes wellness across all aspects of their lives, including healthcare, retirement planning, and paid time off.

We also believe that fostering diversity, equity, inclusion and belonging is a key element to discovering, developing and bringing therapies to patients with cancer. As of December 31, 2023, 56% of our workforce identified as female. We strive to build a workforce representative of the communities and patients we serve and to nurture an inclusive culture where all voices are welcomed, heard, and respected.

Facilities

Our corporate headquarters are located in Cambridge, Massachusetts. We occupy approximately 45,000 square feet of office and laboratory space that we lease in the multi-tenant building in which our corporate headquarters are located. The lease for the substantial majority of this space expires in March 2026. We have an option to extend the lease term for an additional five years thereafter. We believe that this office and laboratory space is sufficient to meet our current needs and that suitable additional space will be available as and when needed.

Corporate Information

We were incorporated in 2001 as a Delaware corporation. Our principal executive offices are located at 840 Memorial Drive, Cambridge, MA 02139, and our telephone number is 617-498-0020. Our internet site is www.mersana.com. We routinely make available important information free of charge, including copies of our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, as soon as reasonably practicable after such reports are electronically filed with, or furnished to, the SEC. We recognize our website as a key channel of distribution to reach public investors and as a means of disclosing material non-public information to comply with our disclosure obligations under SEC Regulation FD. Information contained on our website shall not be deemed incorporated into, or to be part of this Annual Report on Form 10-K, and any website references are not intended to be made through active hyperlinks.

ITEM 1A. RISK FACTORS

Our operations and financial results are subject to various risks and uncertainties, including those described below. The following information about these risks and uncertainties, together with the other information appearing elsewhere in this Annual Report on Form 10-K, including our consolidated financial statements and related notes thereto, should be carefully considered before making any decision to invest in our common stock. The risks and uncertainties described below are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently believe to be immaterial may also adversely affect our business or cause our actual results to differ materially from those contained in forward-looking statements we have made in this report and those we may make from time to time. If any of the following risks occur, our business, financial condition, results of operations and future growth prospects could be materially and adversely affected. We cannot provide assurance that any of the events discussed below will not occur.

Risks Related to Development and Approval of Our ADC Product Candidates

We are currently evaluating a limited number of ADC product candidates in clinical trials. A failure of any of our product candidates in clinical development would adversely affect our business and may require us to discontinue development of other ADC product candidates based on the same technology.

XMT-1660 and XMT-2056 are currently our only product candidates being evaluated in clinical trials. Following our announcement in July 2023 that the data in our single-arm registrational trial evaluating our former lead product candidate, upifitamab rilsodotin, or UpRi, in patients with platinum-resistant ovarian cancer, which we refer to as UPLIFT, did not meet its primary endpoint, we wound down our UpRi-related development activities, and we terminated our Phase 1 combination trial exploring the combination of UpRi with carboplatin, a standard platinum chemotherapy broadly used in the treatment of platinum-sensitive ovarian cancer, which we refer to as UPGRADE-A, and our Phase 3 clinical trial of UpRi as a monotherapy maintenance treatment following treatment with platinum doublets in recurrent platinum-sensitive ovarian cancer, which we refer to as UP-NEXT. Additionally, our clinical trial of XMT-2056 was placed on clinical hold by the U.S. Food and Drug Administration, or FDA, between March 2023 and October 2023 and has not yet resumed. While we have certain other preclinical programs in development, it will take additional investment and time, and regulatory clearance, for such programs to reach the clinical stage of development. In addition, we have other product candidates in our current pipeline that are based on the same platforms as XMT-1660 and XMT-2056. If a product candidate fails in development as a result of any underlying problem with our platforms, then we may be required to discontinue development of the product candidates that are based on the same technologies. If we were required to discontinue development of XMT-1660 or XMT-2056 or of any other current or future product candidate, or if XMT-1660 or XMT-2056 or any other current or future product candidate were to fail to receive regulatory approval or were to fail to achieve sufficient market acceptance, we could be prevented from or significantly delayed in achieving profitability.

Failure of a discovery program or product candidate may occur at any stage of preclinical or clinical development, and, because our and our collaborators' discovery programs and our product candidates are in early stages of preclinical or clinical development, there is a high risk of failure. We or our collaborators may never succeed in obtaining regulatory approval and generating revenue from such discovery programs or product candidates.

We are in the early stages our clinical development efforts of our lead product candidates. We are conducting Phase 1 clinical trials of XMT-1660 and XMT-2056 and have not yet completed a clinical trial for either of these product candidates. Our ability to generate product revenues, which we do not expect will occur for many years, if ever, will depend heavily on the successful development, marketing approval and eventual commercialization of our product candidates, which may never occur. The results from our preclinical studies of XMT-1660 and XMT-2056 and the results from preclinical studies or early clinical trials of any other current or future product candidates are not necessarily predictive of the results from our ongoing or future discovery programs, preclinical studies or clinical trials. Promising results in preclinical studies and early encouraging clinical results of a drug candidate may not be predictive of similar results in later-stage preclinical studies or in humans during clinical trials. Many companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in clinical trials after achieving positive results in earlier stages of clinical development, and we have faced and may again face similar setbacks. For instance, in July 2023, we announced that our UPLIFT Phase 2 clinical trial of UpRi did not meet its primary efficacy endpoint, despite promising efficacy data from our Phase 1b clinical trial of UpRi. Other companies' setbacks have been caused by, among other things, preclinical findings made while clinical trials were underway or safety or efficacy events in preclinical or clinical trials, including previously unreported adverse events. We similarly have identified new safety signals as our clinical trials have advanced, such as our assessment that serious bleeding events appear to occur in patients who received UpRi at a higher rate than background, which assessment led us to submit an aggregate data safety report to the FDA in June 2023.

Similarly, the design of a clinical trial can determine whether its results will support approval of a product, and flaws in the design of a clinical trial may not become apparent until the clinical trial is well advanced. In March 2023, we announced that the FDA had issued a clinical hold on our Phase 1 trial of XMT-2056 following our communication to the FDA that we were voluntarily suspending the trial due to a Grade 5 (fatal) serious adverse event, or SAE, that was deemed to be related to XMT-2056. The SAE occurred in the second patient who had been enrolled at the initial dose level in the dose escalation portion of the Phase 1 clinical trial. On October 31, 2023, we announced that the FDA had lifted the clinical hold and that we had lowered the starting dose in our Phase 1 dose escalation design. We have not yet enrolled any patients in our phase 1 clinical trial of XMT-2056 following the lifting of the clinical hold in October 2023.

Any clinical trials that we may conduct may not demonstrate the efficacy and safety necessary to obtain regulatory approval to market our product candidates. In addition, clinical trial results for one of our product candidates, or for competitor products utilizing similar technology, may raise concerns about the safety or efficacy of other product candidates in our pipeline. If the results of our ongoing or future clinical trials are inconclusive with respect to the efficacy of our product candidates, if we do not meet the clinical endpoints with statistical significance or if there are safety concerns or adverse events associated with our product candidates, we may be prevented from or delayed in obtaining marketing approval for our product candidates. For example, in June 2023, following our submission to the FDA of an aggregate safety analysis across all of our clinical trials of UpRi reporting our assessment that serious bleeding events appear to occur at a higher rate than background, the FDA placed a partial clinical hold on our UPGRADE-A and UP-NEXT clinical trials, and in July 2023, we decided to wind down future development of UpRi, including our UP-NEXT and UPGRADE-A clinical trials, after our UPLIFT clinical trial failed to meet its primary endpoint. Additionally, a patient in our Phase 1 clinical trial of XMT-2056 suffered a Grade 5 SAE, resulting in the clinical hold placed on the trial by the FDA between March 2023 and October 2023. We expect that certain patients in our ongoing clinical trials of XMT-1660 and XMT-2056 and in future clinical trials will experience adverse events, including those that may result in death, as our product candidates progress through clinical development.

There can be significant variability in safety or efficacy results between different clinical trials of the same product candidate due to numerous factors, including changes in trial procedures set forth in protocols, differences in the size and type of the patient populations, changes in and adherence to the dosing regimen and other clinical trial protocols and the rate of dropout among clinical trial participants. Moreover, preclinical and clinical data are often susceptible to varying interpretations and analyses, and many companies that believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain FDA approval. Even if we or our collaborators believe that the results of clinical trials of our product candidates warrant marketing approval, the FDA or comparable foreign regulatory authorities may disagree and may not grant marketing approval of our product candidates.

Alternatively, even if we obtain regulatory approval, that approval may be for indications or patient populations that are not as broad as intended or desired or may require labeling that includes significant use or distribution restrictions or safety warnings. We may also be required to perform additional or unanticipated clinical trials to obtain approval or be subject to additional post-marketing testing requirements to maintain regulatory approval. In addition, regulatory authorities may withdraw their approval of a product or impose restrictions on its distribution, such as in the form of a risk evaluation and mitigation strategy, or REMS, program. The failure to obtain timely regulatory approval of product candidates, any product marketing limitations or a product withdrawal would negatively impact our business, results of operations and financial condition.

Preliminary, interim and top-line data from our clinical trials 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 announce or publish preliminary, interim or top-line data from our clinical trials. Positive preliminary data may not be predictive of such trial's subsequent or overall results. Interim data from clinical trials that we may complete do not necessarily predict final results and are 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. Preliminary or top-line data also remain subject to audit and verification procedures that may result in the final data being materially different from the preliminary or top-line data we may publish. We plan to disclose initial data from our Phase 1 clinical trial of XMT-1660 in mid-2024, but those data may be materially different from final data in the trial. As a result, preliminary, interim and top-line data should be viewed with caution until the final data are available. Adverse differences between preliminary or interim data and final data could significantly harm our business prospects.

Events that may delay or prevent successful commencement, enrollment or completion of clinical trials of our product candidates could result in increased costs to us as well as a delay in obtaining, or failure to obtain, regulatory approval, or cause us to suspend or terminate a clinical trial, which could prevent us from commercializing our product candidates on a timely basis, or at all.

We cannot guarantee that clinical trials, including our ongoing and any future additional clinical trials of XMT-1660, XMT-2056 or any of our other current or future product candidates, will be conducted as planned or completed on schedule, if at all. A failure of one or more clinical trials can occur at any stage of testing, and other events may cause us to temporarily or permanently cease a clinical trial. Events that may prevent successful or timely commencement, enrollment or completion of clinical development include, among others:

- delays in reaching a consensus with regulatory agencies on trial design;
- delays in reaching, or failing to reach, agreement on acceptable terms with prospective clinical research organizations, or CROs, site management organizations, or SMOs, and clinical trial sites;
- difficulties in obtaining required Institutional Review Board, or IRB, or Ethics Committee, or EC, approval at each clinical trial site;
- challenges in recruiting and enrolling suitable patients to participate in clinical trials that meet the criteria of the protocol for the clinical trial;
- imposition of a clinical hold by regulatory agencies, IRBs or ECs for any reason, including safety concerns or after an inspection of clinical operations or trial sites;
- delays in necessary screenings caused by third parties with which we or any of our vendors or suppliers contract;
- failure by CROs, SMOs, other third parties or us to adhere to clinical trial requirements;
- failure to perform in accordance with the FDA's good clinical practices, or GCP, or applicable regulatory guidelines in other countries;
- inadequate quantity or quality of a product candidate or other materials necessary to conduct clinical trials, including, for example, delays in the testing, validation, manufacturing or delivery of the product candidates to the clinical sites;
- patients not completing participation in a trial or not returning for post-treatment follow-up;
- expected or unexpected safety issues, including occurrence of SAEs, associated with any product candidate in clinical trials that are viewed as outweighing the product candidate's potential benefits or reports that may arise from preclinical or clinical testing of other similar cancer therapies that raise safety or efficacy concerns about our product candidates;
- changes in regulatory requirements or guidance that require amending or submitting new clinical protocols or submitting additional data;

- lack of adequate funding to continue one or more clinical trials; or

- geopolitical or other events, including the ongoing conflict between Russia and Ukraine and the war between Israel and Hamas, the Palestinian group that controls the Gaza Strip, that unexpectedly disrupt, delay or generally interfere in regional or worldwide operations of our clinical trial sites, CROs, SMOs or other operations applicable to the conduct of relevant development activities.

Delays, including delays caused by the above factors, can be costly and could negatively affect our ability to commence, enroll or complete our current and anticipated clinical trials. In June 2023, we announced that our UP-NEXT and UPGRADE-A clinical trials of UpRi had been placed on partial clinical hold by the FDA following submission to the FDA of an aggregate safety analysis across all of our clinical trials of UpRi reporting our assessment that serious bleeding events appear to occur at a higher rate than background. In July 2023, following our announcement that the data in our UPLIFT clinical trial of UpRi did not meet its primary endpoint and our plans to wind-down UpRi-related development activities, we terminated our UPGRADE-A and UP-NEXT clinical trials of UpRi. Additionally, in March 2023, we announced that our Phase 1 clinical trial of XMT-2056 had been placed on clinical hold by the FDA following a Grade 5 SAE. The FDA lifted this clinical hold in October 2023, and we are working to resume enrollment in this clinical trial, but no patients are currently enrolled. If we or our collaborators are not able to successfully complete clinical trials, we or they will not be able to obtain regulatory approval and will not be able to commercialize our product candidates or our collaborators' product candidates based on our technology.

An inability to enroll sufficient numbers of patients in our clinical trials could result in increased costs and longer development periods for our product candidates.

Clinical trials require sufficient patient enrollment, which is a function of many factors, including:

- the size and nature of the patient population;

- the severity of the disease under investigation;

- the nature and complexity of the trial protocol, including eligibility criteria for the trial;

- the design of the trial;

- the number of clinical trial sites and the proximity of patients to those sites;

- the standard of care in the diseases under investigation;

- the ability and commitment of clinical investigators to identify eligible patients;

- clinicians' and patients' perceptions of the potential advantages and risks of the drug being studied in relation to other available therapies, including any new drugs that may be approved for the indications we are investigating; and

- the risk that patients enrolled in clinical trials will drop out of the trials before completion or, because they are late-stage cancer patients, that they will not survive the full terms of the clinical trials.

In addition, our clinical trials will compete with other clinical trials for product candidates that are in the same therapeutic areas as our current and future product candidates. This competition will reduce the number and types of patients available to us, because some patients who might have opted to enroll in our trials may instead opt to enroll in a trial conducted by one of our competitors. Since the number of qualified clinical investigators is limited, we expect to conduct some of our clinical trials at the same clinical trial sites that some of our competitors use, which will reduce the number of patients who are available for our clinical trials at such sites. Moreover, because certain of our current and future product candidates, including those based on our Immunosynthen stimulator of interferon genes-, or STING-, agonist platform, represent innovations over more commonly used methods for cancer treatment, including other approved ADC medicines, potential patients and their doctors may be inclined to use conventional oncology therapies or other approved ADC medicines, rather than enroll patients in our ongoing or any future clinical trials.

Challenges in recruiting and enrolling suitable patients to participate in clinical trials that meet the criteria of the protocol could increase costs and result in delays to our current development plans for XMT-1660, XMT-2056 or any other current or future product candidate.

Our product candidates may cause undesirable or unexpectedly severe side effects that could delay or prevent their regulatory approval, limit the commercial profile of an approved label, or result in significant negative consequences following marketing approval, if any.

Undesirable or unexpectedly severe side effects caused by our product candidates could cause us to interrupt, delay or halt preclinical studies or could cause us or regulatory authorities to interrupt, delay or halt clinical trials and could result in a more restrictive label or the delay or denial of regulatory approval by the FDA or comparable foreign regulatory authorities. It is likely that, as is the case with many treatments for the serious diseases for which we are developing our product candidates, there may be side effects associated with the use of our product candidates, including severe treatment-related adverse events, or TRAEs, including death. Results of our trials could reveal a high and unacceptable severity and prevalence of these or other side effects. In such an event, our trials could be suspended or terminated and the FDA or comparable foreign regulatory authorities could order us to cease further development of or deny approval of our product candidates for any or all targeted indications. TRAEs could also 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.

For example, patients in our clinical trials of UpRi, for which we discontinued development in 2023 and which was developed using our Dolaflexin platform, experienced severe TRAEs including, without limitation, death, hemorrhage, AST elevation, nausea, platelet count decrease (including thrombocytopenia), fatigue, anemia, pyrexia, ALT elevation, blood ALP/LDH increase, proteinuria, vomiting, asthenia, diarrhea, headache, peripheral neuropathy, neutropenia and pneumonitis. Also, patients in our clinical trial of XMT-1592, for which we discontinued development in May 2022 and which was developed using our Dolasynthen platform, also experienced severe TRAEs of anemia and pneumonitis. Additionally, our Phase 1 clinical trial of XMT-2056, which was developed using our Immunosynthen platform, was placed on clinical hold by the FDA from March 2023 to October 2023 following a Grade 5 serious adverse event, or SAE.

We are also conducting a Phase 1 clinical trial of XMT-1660, which was developed using our Dolasynthen platform. Because our product candidates share some but not all platform technologies, payloads and targets, we may find it difficult to predict or assess whether safety events reported for any one product candidate are related to such shared attributes. We may observe undesirable side effects, including severe TRAEs, including those that may result in death, or other SAEs or potential safety issues in nonclinical studies or in clinical trials at any stage of development of our product candidates, including XMT-1660 and XMT-2056. Any such severe TRAEs, SAEs or other potential safety issues may be similar to or in addition to other severe TRAEs, SAEs or other safety issues we have previously observed in our clinical trials of UpRi, XMT-1592 or any other product candidate.

Additionally, we and our clinical trial investigators currently determine if serious adverse or undesirable side effects are drug-related. The FDA or comparable regulatory authorities may disagree with our or our clinical trial investigators' interpretation of data from clinical trials and the conclusion by us or our clinical trial investigators that an SAE or undesirable side effect was not drug-related. The FDA or comparable regulatory authorities may require more information related to the safety of our product candidates, including additional preclinical or clinical data to support approval, which may cause us to incur additional expenses, delay or prevent the approval of one of our product candidates, and/or delay or cause us to change our commercialization plans, or we may decide to abandon the development of the product candidate altogether.

Further, by design, clinical trials rely on a sample of the potential patient population. With a limited number of patients and limited duration of exposure, rare and severe side effects of our product candidates may only be uncovered when a significantly larger number of patients is exposed to the product candidate. If our product candidates receive marketing approval and we or others identify undesirable side effects caused by such product candidates after such approval, a number of potentially significant negative consequences could result, including:

- regulatory authorities may require the addition of labeling statements, such as a "black box" warning or a contraindication;
- we may be required to create a medication guide outlining the risks of such side effects for distribution to patients;
- regulatory authorities may require a REMS plan to mitigate risks, which 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;
- we may be required to change the way such product candidates are distributed or administered, conduct additional clinical trials or change the labeling of the product candidates;

- we may be subject to regulatory investigations and government enforcement actions;
- regulatory authorities may withdraw or limit their approval of such product candidates;
- we may decide to remove such product candidates from the marketplace;
- we could be sued and held liable for injury caused to individuals exposed to or taking our product candidates; and
- we may suffer reputational harm.

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.

Similarly, undesirable or severe side effects of ADCs developed or commercialized by our collaborators or competitors could cause the FDA or comparable regulatory authorities to take actions that would materially and adversely affect our ability to conduct clinical trials of our product candidates or, if any are approved for marketing, to commercialize such product candidates.

We may choose not to develop a potential product candidate, or we may suspend or terminate one or more discovery or preclinical programs or product candidates.

At any time and for any reason, we may determine that one or more of our discovery programs, preclinical programs or product candidates does not have sufficient potential to warrant the allocation of resources toward such program or product candidate. Furthermore, because we have limited financial and personnel resources, we have placed significant focus on the development of a limited number of product candidates, including XMT-1660 and XMT-2056 and historically including UpRi and XMT-1592. Accordingly, we may choose not to develop a product candidate or elect to suspend or terminate one or more of our discovery or preclinical programs. If we suspend or terminate a program or product candidate in which we have invested significant resources, we will have expended resources on a program or product candidate that will not provide a full return on our investment. For example, in July 2023, we announced our decision to discontinue further development of UpRi based on the failure of our Phase 2 UPLIFT clinical trial to meet its primary endpoint. Additionally, in May 2022, we decided to discontinue development of XMT-1592 based in part on the lower prevalence of the NaPi2b biomarker in non-small cell lung cancer, or NSCLC, and the increasingly competitive nature of such indication. We may also cease developing a product candidate for a particular indication. For example, in November 2021, we determined to cease developing UpRi as a single agent in patients with NSCLC and determined to focus development on patients with ovarian cancer. As a result, we may have missed an opportunity to have allocated the resources originally used to develop UpRi and XMT-1592 to potentially more productive uses, including existing or future programs or product candidates. If we do not accurately evaluate the commercial potential or target market for a particular future product candidate, we may relinquish valuable rights to future product candidates through collaboration, licensing or other royalty arrangements.

We or our collaborators may fail to discover and develop additional potential product candidates.

Our and our collaborators' research programs to identify new product candidates will require substantial technical, financial and human resources, and we or our collaborators may be unsuccessful in our or their efforts to identify new product candidates. If we or our collaborators are unable to identify suitable additional product candidates for preclinical and clinical development, our or their ability to develop product candidates and our ability to obtain revenues from commercializing our products or to receive royalties from our collaborators' sales of their products in future periods could be compromised, which could result in significant harm to our financial position and adversely impact our stock price.

Risks Related to our Financial Position and Need for Additional Capital

We will require substantial additional financing to achieve our goals, and a failure to obtain this necessary capital when needed could force us to delay, limit, reduce or terminate our product development or future commercialization efforts.

Our cash, cash equivalents and marketable securities were $209.1 million as of December 31, 2023. We have utilized substantial amounts of cash since our inception and expect that we will continue to expend substantial resources for the foreseeable future developing XMT-1660, XMT-2056 and any other current or future product candidates. These expenditures may include costs associated with research and development, conducting preclinical studies and clinical trials, potentially obtaining regulatory approvals and manufacturing products, as well as marketing and selling products approved for sale, if any, and potentially acquiring new technologies. In addition, other unanticipated costs may arise. Because the outcome of our planned and anticipated clinical trials is highly uncertain, we cannot reasonably estimate the actual amounts necessary to successfully complete the development and commercialization of our product candidates. Our costs will increase if we experience any delays in our clinical trials for any current or future product candidates, including delays in enrollment of patients. We may also incur costs associated with operating as a public company, hiring additional personnel and expanding our facilities in the future.

Our future capital requirements depend on many factors, including:

- the scope, progress, results and costs of researching and developing XMT-1660, XMT-2056 and any other current or future product candidates and conducting preclinical studies and clinical trials;
- the cost of manufacturing XMT-1660, XMT-2056 and any other current or future product candidates for clinical trials in preparation for regulatory approval and in preparation for commercialization;
- the timing of, and the costs involved in, obtaining regulatory approvals for XMT-1660, XMT-2056 and any other current or future product candidates if preclinical studies and clinical trials are successful;
- the cost of commercialization activities for XMT-1660, XMT-2056 and any other current or future product candidates, if any product candidates are approved for sale, including manufacturing, marketing, sales and distribution costs;
- our ability to establish and maintain strategic collaborations, licensing or other arrangements and the financial terms of such agreements;
- the costs involved in preparing, filing, prosecuting, maintaining, defending and enforcing patent claims, including litigation costs and the outcome of any such litigation;
- the timing, receipt and amount of sales of, or royalties on, our future products, if any, or products developed by our collaborators;
- the emergence of competing cancer therapies and other adverse market developments; and
- the requirement for or the cost of developing any companion diagnostics and/or complementary diagnostics.

We believe that our current cash, cash equivalents and marketable securities will be sufficient to fund our current operating plan commitments into 2026. However, we have based these estimates on assumptions that may prove to be wrong, Our operating plan may change as a result of many factors currently unknown to us, and we may need additional funds sooner than planned. Additional funds may not be available when we need them on terms that are acceptable to us, or at all. If adequate funds are not available to us on a timely basis, we may be required to delay, limit, reduce or terminate preclinical studies, clinical trials or other development activities for one or more of our product candidates or delay, limit, reduce or terminate our future establishment of sales and marketing capabilities or other activities that may be necessary to commercialize our product candidates. Even if we believe we have sufficient funds for our current or future operating plans, we may seek additional capital due to favorable market conditions or strategic considerations.

We have incurred net losses since our inception, we have no products approved for commercial sale and we anticipate that we will continue to incur substantial operating losses for at least the next several years. We may never achieve or sustain profitability.

We have incurred net losses since our inception. Our net loss was $171.7 million, $204.2 million, and $170.1 million, respectively, for the years ended December 31, 2023, 2022 and 2021, respectively. As of December 31, 2023, we had an accumulated deficit of $826.4 million. Our losses have resulted principally from costs incurred in our discovery and development activities. Our net losses may fluctuate significantly from quarter to quarter and year to year. To date, we have not commercialized any products or generated any revenues from the sale of products, and we do not expect to generate any product revenues for the foreseeable future. Absent the realization of sufficient revenues from product sales, we may never achieve profitability in the future.

We have devoted most of our financial resources to research and development, including our clinical and preclinical development activities. To date, we have financed our operations primarily with the proceeds from our strategic collaborations, private placements of our preferred stock and public offerings of our common stock, including our initial public offering, our follow-on public offerings in 2019 and 2020 and our at-the-market, or ATM, equity offering programs. The amount of our future net losses will depend, in part, on the rate of our future expenditures. We have not completed pivotal clinical trials for any product candidate and have only a limited number of product candidates in current or planned clinical trials. It will be several years, if ever, before we have a product candidate ready for commercialization. Even if we obtain regulatory approval to market a product candidate, our future revenues would depend upon the size of the market or markets in which our product candidates received such approval and our ability to achieve sufficient market acceptance, reimbursement from third-party payors and adequate market share for our product candidates in those markets.

We expect to continue to incur significant expenses and operating losses over the next several years. Our expenses may increase in connection with our ongoing activities, as we:

- continue clinical development and manufacturing activities for XMT-1660 and XMT-2056;
- continue activities to discover, validate and develop additional product candidates, including XMT-2068 and XMT-2175;
- conduct research and development activities under our collaborations;
- obtain marketing approvals for our current and future product candidates for which we complete clinical trials;
- develop a sustainable and scalable manufacturing process for our product candidates, including establishing and maintaining commercially viable supply and manufacturing relationships with third parties;
- address any competing technological and market developments;
- maintain, expand and protect our intellectual property portfolio; and
- hire additional research, development and general and administrative personnel.

If we are required by the FDA or any equivalent foreign regulatory authority to perform clinical trials or preclinical trials in addition to those we currently expect to conduct, or if there are any delays in completing the clinical trials of XMT-1660, XMT-2056 or any other current or future product candidates, our expenses could increase.

To become and remain profitable, we must succeed in developing our product candidates, obtaining regulatory approval for them, and manufacturing, marketing and selling those products for which we may obtain regulatory approval. We may not succeed in these activities, and we may never generate revenue from product sales or strategic collaborations in an amount sufficient to achieve profitability. Even if we achieve profitability in the future, we may not be able to sustain profitability in subsequent periods. Our failure to become or remain profitable would depress our market value and could impair our ability to raise capital, expand our business, discover or develop other product candidates or continue our operations.

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

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our capital need through a variety of means, including through private and public equity offerings, debt financings, collaborations, strategic alliances and licensing arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interests of our common stockholders will be diluted, and the terms of such equity or convertible debt securities may include liquidation or other preferences that are senior to or otherwise adversely affect the rights of our common stockholders. Additional debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take certain actions, such as incurring future debt, making capital expenditures, declaring dividends or encumbering our assets to secure future indebtedness, each of which could adversely impact our ability to conduct our business and execute our operating plan. If we raise additional funds through strategic collaborations with third parties, we may have to relinquish valuable rights to our technologies, including our platforms, or product candidates, or grant licenses on terms that are not favorable to us. If we are unable to raise additional funds through equity or debt financing when needed, we may be required to delay, limit, reduce or terminate our product development or future commercialization efforts for XMT-1660, XMT-2056 or any other current or future product candidates or grant rights to third parties to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

We have a credit facility that requires us to comply with certain affirmative and negative covenants and places restrictions on our operating and financial flexibility.

In October 2021, we entered into a Loan and Security Agreement, or the New Credit Facility, with Oxford Finance LLC as the collateral agent and a lender, Silicon Valley Bank, a division of First-Citizens Bank & Trust Company, as a lender, and the other lenders party thereto, or together the Lenders. Pursuant to the New Credit Facility, as amended to date, we have borrowed $25 million, and no additional borrowing amounts are available to us under the New Credit Facility, as amended. The New Credit Facility is secured by substantially all of our personal property owned or later acquired, excluding intellectual property (but including the right to payments and proceeds from intellectual property), and a negative pledge on intellectual property.

The New Credit Facility also includes customary representations and warranties and affirmative and negative covenants, as well as customary events of default. Certain of the customary negative covenants limit our ability, among other things, to incur future debt, grant liens, make investments, make acquisitions, distribute dividends, make certain restricted payments and sell assets, subject in each case to certain exceptions. Our failure to comply with these covenants would result in an event of default under the Loan and Security Agreement and could result in the acceleration of the obligations we owe pursuant to the New Credit Facility.

We may expend our resources to pursue a particular product candidate and fail to capitalize on product candidates 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. As a result, we may forgo or delay pursuit of opportunities with other product candidates that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Failure to properly assess potential product candidates could result in our focus on product candidates with low market potential, which would harm our business and financial condition. 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 collaboration, licensing or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate.

Risks Related to Our Reliance on Third Parties

Because we rely on third-party manufacturers and suppliers, our supply of research and development, preclinical and clinical development materials may become limited or interrupted or may not be of satisfactory quantity or quality.

We rely on third-party contract manufacturers to manufacture our preclinical and clinical trial product supplies, as well as to support our manufacturing obligations under our current collaborations, and we lack the internal resources and the capability to manufacture any product candidates on a clinical or commercial scale. The facilities used by our contract manufacturers to manufacture the active pharmaceutical ingredient and final drug product must be acceptable to the FDA and other comparable foreign regulatory agencies pursuant to inspections that would be conducted after we submit our marketing application or relevant foreign regulatory submission to the applicable regulatory agency. There can be no assurance that our preclinical and clinical development product supplies will be sufficient, uninterrupted or of satisfactory quality or continue to be available at acceptable prices. If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or applicable foreign regulatory agencies, they will not be able to secure or maintain regulatory approval for their manufacturing facilities. Additionally, if geopolitical events that are beyond our control or the control of our contract manufacturers create barriers to performance that impede their ability to manufacture for or deliver manufactured supplies to us, we may be unable to secure an adequate inventory of preclinical and clinical development product supplies. Any replacement of our manufacturers could require significant effort and expertise because there may be a limited number of qualified replacements.

The manufacturing process for a product candidate is subject to FDA and foreign regulatory authority review. Suppliers and manufacturers must meet applicable manufacturing requirements and undergo rigorous facility and process validation tests required by regulatory authorities in order to comply with regulatory standards, such as current good manufacturing practices. We have no direct control over our contract manufacturers' ability to maintain adequate quality control, quality assurance and qualified personnel. In the event that any of our manufacturers fails to comply with regulatory requirements or to perform its obligations to us in relation to quality, timing or otherwise, or if our supply of components or other materials becomes limited or interrupted for other reasons, we may be forced to manufacture the materials ourselves, for which we currently do not have the capabilities or resources, or enter into an agreement with another third party, which we may not be able to do on reasonable terms, if at all. 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. These factors would increase our reliance on such manufacturer or require us to obtain a license from such manufacturer in order to have another third-party manufacture our product candidates. If we are required to change manufacturers for any reason, we will be required to verify that the new manufacturer maintains facilities and procedures that comply with quality standards and with all applicable regulations and guidelines. The delays associated with the verification of a new manufacturer could negatively affect our ability to develop product candidates in a timely manner or within budget. Our reliance on contract manufacturers also exposes us to the possibility that they, or third parties with access to their facilities, will have access to and may appropriate our trade secrets or other proprietary information.

We expect to continue to rely on third-party manufacturers if we receive regulatory approval for any product candidate. To the extent that we have existing, or enter into future, manufacturing arrangements with third parties, we will depend on these third parties to perform their obligations in a timely manner consistent with contractual and regulatory requirements, including those related to quality control and assurance. If we are unable to obtain or maintain third-party manufacturing for product candidates, or to do so on commercially reasonable terms, we may not be able to develop and commercialize our product candidates successfully. Our or a third party's failure to execute on our manufacturing requirements and comply with current good manufacturing practices, or cGMP, could adversely affect our business in a number of ways, including:

- a delay or inability to initiate or continue clinical trials of product candidates under development;
- delay in submitting regulatory applications, or delay or failure to receive regulatory approvals, for product candidates;
- loss of the cooperation of an existing or future strategic collaborator;
- subjecting third-party manufacturing facilities or our manufacturing facilities to additional inspections by regulatory authorities;
- a requirement to cease distribution or to recall batches of our product candidates;

- in the event of approval to market and commercialize a product candidate, an inability to meet commercial demands for our products; and

- fines, adverse publicity, and civil and criminal enforcement and sanctions.

We, or our third-party manufacturers, may be unable to successfully scale-up manufacturing of our ADC product candidates in sufficient quality and quantity, which would delay or prevent us from developing our ADC product candidates and commercializing approved products, if any.

In order to conduct clinical trials of our product candidates and commercialize any approved product candidates, we, or our third-party manufacturers, will need to manufacture them in large quantities. We, or our third-party manufacturers, may be unable to successfully increase the manufacturing capacity for any of our product candidates in a timely or cost-effective manner, or at all. In addition, quality issues may arise during scale-up activities. If we or any third-party manufacturer are unable to successfully scale up the manufacture of our product candidates in sufficient quality and quantity, the development, testing and clinical trials of that product candidate may be delayed or infeasible, and regulatory approval or commercial launch of any resulting product may be delayed or not obtained, which could significantly harm our business. If we are unable to obtain or maintain third-party manufacturing for commercial supply of our product candidates, or to do so on commercially reasonable terms, we may not be able to develop and commercialize our product candidates successfully.

We rely on third parties to conduct preclinical studies and clinical trials for XMT-1660, XMT-2056 and our other product candidates, and if such third parties do not properly, timely and successfully perform their obligations to us, we may not be able to obtain regulatory approvals for XMT-1660, XMT-2056 or any other current or future ADC product candidates.

We designed the ongoing clinical trials of XMT-1660 and XMT-2056, the trial for XMT-1592 that closed in 2022, our UPLIFT, UPGRADE-A and UP-NEXT clinical trials of UpRi, for which we discontinued development in 2023, and we intend to design any future clinical trials for any future product candidates that we may develop if preclinical studies are successful and we do not have a strategic collaborator responsible for such trial design. However, we rely on CROs, SMOs, clinical sites, investigators and other third parties to assist in managing, monitoring and otherwise carrying out many of these trials. As a result, we have less direct control over the conduct, timing and completion of these clinical trials and the management of data developed through clinical trials than would be the case if we were relying entirely upon our own staff. These CROs, SMOs, investigators and other third parties are not our employees, and we have limited control over the amount of time and resources that they dedicate to our programs. We compete with many other companies for the resources of these third parties. These third parties may have contractual relationships with other entities, some of which may be our competitors, which may draw time and resources from our programs. The third parties with whom we contract might not be diligent, careful or timely in conducting our preclinical studies or clinical trials, or complying with current good laboratory practices or current good clinical practices, as applicable, resulting in the preclinical studies or clinical trials being delayed or unsuccessful.

The third parties on whom we rely generally may terminate their engagements at any time, and having to enter into alternative arrangements would delay development and commercialization of our product candidates. Communicating with outside parties can also be challenging, potentially leading to mistakes as well as difficulties in coordinating activities. Outside parties may:

- have staffing difficulties;

- fail to comply with contractual obligations;

- experience regulatory compliance issues;

- undergo changes in priorities or become financially distressed; or

- form relationships with other entities, some of which may be our competitors.

The FDA and comparable foreign regulatory authorities require compliance with regulations and standards, including GCP, for designing, conducting, monitoring, recording, analyzing and reporting the results of clinical trials to assure that the data and results are credible and accurate and that the rights, integrity and confidentiality of trial participants are protected. Although we rely, and intend to continue to rely, on third parties to conduct our clinical trials, they are not our employees, and we are responsible for ensuring that each of these clinical trials is conducted in accordance with its general investigational plan, protocol and other requirements. Our reliance on these third parties for research and development activities will reduce our control over these activities but will not relieve us of our responsibilities. For any violations of laws or regulations during the

conduct of our clinical trials, we could be subject to untitled and warning letters or enforcement action that may include civil penalties up to and including criminal prosecution.

If these third parties do not successfully carry out their duties under their agreements, if the quality or accuracy of the data they obtain is compromised due to their failure to adhere to clinical trial protocols or to regulatory requirements, or if they otherwise fail to comply with clinical trial protocols or meet expected deadlines, the clinical trials of our product candidates may not meet regulatory requirements. The FDA enforces GCP regulations through periodic inspections of clinical trial sponsors, principal investigators and trial sites. If we or our CROs fail to comply with applicable GCPs or other regulatory requirements, the clinical data generated in our clinical trials may be deemed unreliable, third parties may need to be replaced, we may be subject to negative publicity, fines and civil or criminal sanctions, and preclinical development activities or clinical trials may be extended, delayed, suspended or terminated. If any of these events occur, we may not be able to obtain regulatory approval of our product candidates on a timely basis or at all.

We depend on certain strategic relationships with other companies to assist in the research, development and commercialization of our ADC platforms and ADC product candidates. If our existing significant collaborators do not perform as expected, this may negatively affect our ability to commercialize our ADC product candidates or generate revenues through technology licensing or may otherwise negatively affect our business.

We have established strategic collaborations and intend to continue to establish strategic collaborations and other relationships with third parties to research, develop and commercialize our platforms and existing and future product candidates. In December 2022, we entered into a collaboration and license agreement with Ares Trading, S.A., an affiliate of Merck KGaA, Darmstadt, Germany, or Merck KGaA, for the research, development and commercialization of ADC product candidates leveraging our Immunosynthen platform, and in February 2022, we entered into a collaboration agreement with Janssen Biotech, Inc., or Johnson & Johnson, for the research, development and commercialization of ADC product candidates leveraging our Dolasynthen platform. Additionally, in August 2022, we entered into an option, collaboration and license agreement with GlaxoSmithKline Intellectual Property (No. 4) Limited, or GSK, pursuant to which we granted GSK an exclusive option to obtain an exclusive license to co-develop and to commercialize products containing XMT-2056. Under these arrangements, we will depend on our collaborators to design and conduct their clinical trials. As a result, we will not be able to control or oversee the conduct of these programs by our collaborators and those programs may not be successful, which may negatively impact our business operations. In addition, if any of these collaborators withdraw support for these programs or proposed products or otherwise impair their development or experience negative results, our business and our product candidates could be negatively affected.

Our collaborators may terminate their agreements with us for cause under certain circumstances or at will in certain cases and discontinue use of our technologies. In addition, we cannot control the amount and timing of resources our collaborators may devote to products utilizing or incorporating our technology. Moreover, our relationships with our collaborators may divert significant time and effort of our scientific staff and management team and require effective allocation of our resources to multiple internal and collaborative projects. Our collaborators may fail to perform their obligations under the collaboration agreements or may not perform their obligations in a timely manner. If conflicts arise between our collaborators and us, the other party may act in a manner adverse to us and could limit our ability to implement our strategies. If any of our significant collaborators terminate or breach our agreements with them, or otherwise fail to complete their obligations in a timely manner, or if GSK ultimately decides not to exercise its option for a license to co-develop and commercialize XMT-2056, it may have a detrimental effect on our financial position by reducing or eliminating the potential for us to receive technology access and license fees, milestones and royalties, reimbursement of development costs, as well as possibly requiring us to devote additional efforts and incur costs associated with pursuing internal development of product candidates. Furthermore, if our collaborators do not prioritize and commit sufficient resources to programs associated with our product candidates or collaboration product candidates, we or our collaborators may be unable to commercialize these product candidates, which would limit our ability to generate revenue and become profitable.

Our collaborators may separately pursue competing products, therapeutic approaches or technologies to develop treatments for the diseases targeted by us or our collaborators. Competing products, either developed by our collaborators or to which our collaborators have rights, may result in the withdrawal of collaborators support for our product candidates. Even if our collaborators continue their contributions to the strategic relationships, they may nevertheless determine not to actively pursue the development or commercialization of any resulting products. Additionally, if our collaborators pursue different clinical or regulatory strategies with their product candidates based on our platforms or technologies, adverse events with their product candidates could negatively affect our product candidates utilizing similar technologies. Any of these developments could harm our product development efforts.

To date, we have depended on a small number of collaborators for a substantial portion of our revenue. The loss of any one of these collaborators could result in non-achievement of our expected revenue payments.

We have entered into strategic collaborations with a limited number of companies. To date, a substantial portion of our revenue has resulted from payments made under certain agreements with our strategic collaborators, and we expect that a portion of our revenue will continue to come from strategic collaborations. The loss of any of our collaborators, or the failure of our collaborators to perform their obligations under their agreements with us, including paying license or technology fees, milestone payments, royalties or reimbursements, could have a material adverse effect on our financial performance. Payments under our existing and future strategic collaborations are also subject to significant fluctuations in both timing and amount, which could cause our revenue to fall below the expectations of securities analysts and investors and cause a decrease in our stock price.

We may seek to establish additional strategic collaborations, and if we are not able to establish them on commercially reasonable terms, or maintain them, we may have to alter our development and commercialization plans.

We continue to strategically evaluate our collaborations and, as appropriate, we expect to enter into additional strategic collaborations in the future, including potentially with major biotechnology or biopharmaceutical companies. We face significant competition in seeking appropriate collaborators for our product candidates and platforms, and the negotiation process is time-consuming and complex. In order for us to successfully collaborate with a third-party to leverage our platforms or advance our product candidates, potential collaborators must view these platforms and product candidates as economically valuable in markets they determine to be attractive in light of the terms that we are seeking and other available platforms and products for licensing by other companies. Even if we are successful in our efforts to establish strategic collaborations, the terms that we agree upon may not be favorable to us, and we may not be able to maintain such strategic collaborations if, for example, development or approval of a product candidate is delayed or sales of an approved product are disappointing. Any delay in entering into strategic collaboration agreements related to our product candidates or platforms could delay the development and commercialization of existing or future product candidates and reduce their competitiveness even if they reach the market. If we are not able to generate revenue under our strategic collaborations when and in accordance with our expectations or the expectations of industry analysts, this failure could harm our business and have an immediate adverse effect on the trading price of our common stock.

If we fail to establish and maintain additional strategic collaborations related to our product candidates for which we have not yet entered into a strategic collaboration, we will bear all of the risk and costs related to the development of any such product candidate, and we may need to seek additional financing, hire additional employees and otherwise develop additional expertise for which we have not budgeted. If we are not successful in seeking additional financing, hiring additional employees or developing additional expertise, if necessary, our cash burn rate would increase or we would need to take steps to reduce our rate of product candidate development. This could negatively affect the development of any product candidate for which we do not currently have a collaborator.

Risks Related to Commercialization of Our ADC Product Candidates

Our future commercial success depends upon attaining significant market acceptance of our ADC product candidates, if approved, among physicians, patients and health care payors.

Even if we obtain regulatory approval for any other current or future product candidates that we may develop or acquire in the future, the product candidate may not gain market acceptance among physicians, health care payors, patients and the broader healthcare community. Market acceptance of any approved products depends on a number of factors, including:

- the efficacy and safety of the product, as demonstrated in clinical trials;
- the indications for which the product is approved and the label approved by regulatory authorities for use with the product, including any warnings that may be required on the label;
- acceptance by physicians and patients of the product as a safe and effective treatment;
- the cost, safety and efficacy of treatment in relation to alternative treatments;
- the availability of adequate reimbursement and pricing by third-party payors and government authorities;
- relative convenience and ease of administration;

- the prevalence and severity of adverse side effects; and
- the effectiveness of our sales and marketing efforts.

Perceptions of any product are influenced by perceptions of competitors' products. As a result, adverse public perception of our competitors' products may negatively impact the market acceptance of our product candidates. Market acceptance is critical to our ability to generate significant revenue and become profitable. Any therapeutic candidate, if approved and commercialized, may be accepted in only limited capacities or not at all. If any approved products are not accepted by the market to the extent that we expect, we may not be able to generate significant revenue and our business would suffer.

The incidence and prevalence for target patient populations of our drug candidates have not been established with precision. If the market opportunities for our drug candidates are smaller than we estimate, or if any approval that we obtain is based on a narrower definition of the patient population, our revenue and ability to achieve profitability will be adversely affected, possibly materially.

The precise incidence and prevalence of B7-H4-expressing cancers and human epidermal growth factor receptor 2-, or HER2-, expressing cancers are uncertain. Our estimates of the number of people who have these diseases, as well as the subset of people who have the potential to benefit from treatment with our product candidates are based on estimates. The total addressable market opportunity for XMT-1660, XMT-2056 or any of our other current or future product candidates will ultimately depend upon, among other things, the diagnosis criteria included in the final label for each such product candidate if our product candidates are approved for sale for these indications, acceptance by the medical community, and patient access, drug pricing and reimbursement. The number of patients who can be treated with XMT-1660, XMT-2056 or any of our other current or future product candidates may turn out to be lower than expected, patients may not be otherwise amenable to treatment with our drugs or we may face increasing difficulties in identifying or gaining access to new patients, all of which would adversely affect our results of operations and our business.

If we are unable to establish sales, marketing and distribution capabilities, we may not be successful in commercializing our product candidates if and when they are approved.

We do not have a sales or marketing infrastructure and have no experience in the sale, marketing or distribution of products. To achieve commercial success for any product for which we have obtained marketing approval, we will need to establish a sales and marketing organization or pursue a collaborative arrangement for such sales and marketing.

In the future, we expect to build a focused sales and marketing infrastructure to market XMT-1660 and any other current or future product candidates in the United States and certain foreign jurisdictions, if and when they are approved, and we may potentially do so for XMT-2056. There are risks involved with establishing our own sales, marketing and distribution capabilities. For example, recruiting and training a sales force is expensive and time consuming and could delay any product launch. If the commercial launch of a product candidate for which we recruit a sales force and establish marketing capabilities is delayed or does not occur for any reason, we would have prematurely or unnecessarily incurred these commercialization expenses. This may be costly, and our investment would be lost if we cannot retain or reposition our sales and marketing personnel.

Factors that may inhibit our efforts to commercialize our products on our own include:

- our inability to recruit, train and retain adequate numbers of effective sales and marketing personnel;
- the inability of sales personnel to obtain access to physicians;
- the lack of adequate numbers of physicians to prescribe any future products;
- the lack of complementary products to be offered by sales personnel, which may put us at a competitive disadvantage relative to companies with more extensive product lines; and
- unforeseen costs and expenses associated with creating an independent sales and marketing organization.

If we are unable to establish our own sales, marketing and distribution capabilities and enter into arrangements with third parties to perform these services, our product revenues and our profitability, if any, are likely to be lower than if we were to market, sell and distribute any products that we develop ourselves.

In addition, we may not be successful in entering into arrangements with third parties to sell, market and distribute certain of our product candidates outside of the United States or may be unable to do so on terms that are favorable to us. We likely will have limited 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 do not establish sales, marketing and distribution capabilities successfully, either on our own or in collaboration with third parties, we will not be successful in commercializing our product candidates.

Reimbursement may be limited or unavailable in certain market segments for our ADC product candidates, which could make it difficult for us to sell our products profitably.

In both domestic and foreign markets, sales of any of our product candidates, if approved, will depend, in part, on the extent to which the costs of our products will be covered by third-party payors, such as government health programs, commercial insurance and managed health care organizations. These third-party payors decide which drugs will be covered and establish reimbursement levels for those drugs. The containment of health care costs has become a priority of foreign and domestic governments as well as private third-party payors. The prices of drugs have been a focus in this effort. Governments and private third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications, which could affect our ability to sell our product candidates profitably. Cost-control initiatives could cause us to decrease the price we might establish for products, which could result in lower than anticipated product revenues.

Reimbursement by a third-party payor may depend upon a number of factors, including the third-party payor's determination that use of a product is:

- a covered benefit under its health plan;
- safe, effective and medically necessary;
- appropriate for the specific patient;
- cost-effective; and
- neither experimental nor investigational.

Adverse pricing limitations may hinder our ability to recoup our investment in XMT-1660, XMT-2056 or any other current or future product candidates, even if such product candidates obtain marketing approval.

Obtaining coverage and reimbursement approval for a product from a government or other third-party payor is a time consuming and costly process that could require us to provide supporting scientific, clinical and cost-effectiveness data for the use of our products to the payor. Further, there is significant uncertainty related to third-party payor coverage and reimbursement of newly approved drugs. We may not be able to provide data sufficient to gain acceptance with respect to coverage and reimbursement. We cannot be sure that coverage or adequate reimbursement will be available for any of our product candidates. Also, we cannot be sure that reimbursement amounts will not reduce the demand for, or the price of, our products. If reimbursement is not available or is available only to limited levels, we may not be able to commercialize certain of our products. In addition, in the United States, third-party payors are increasingly attempting to contain health care costs by limiting both coverage and the level of reimbursement of new drugs. As a result, significant uncertainty exists as to whether and how much third-party payors will reimburse patients for their use of newly approved drugs, which in turn will put pressure on the pricing of drugs. Manufacturers further may be required to offer price concessions to achieve sales or favorable coverage.

Price controls may be imposed in the United States and foreign markets, which may adversely affect our future profitability.

In the United States, the prices of pharmaceutical products are increasingly subject to review and legislative actions to exert government regulation over the costs of such products. Further, in a number of foreign countries, including member states of the European Union, the pricing of prescription drugs is subject to governmental control. Additional countries may adopt similar approaches to the pricing of prescription drugs. In such countries, pricing negotiations with governmental authorities can take considerable time after receipt of marketing approval for a product. In addition, there can be considerable pressure by governments and other stakeholders on prices and reimbursement levels, including as part of cost containment measures. Political, economic and regulatory developments may further complicate pricing negotiations, and pricing negotiations may continue after reimbursement has been obtained. Reference pricing used by various European Union member states and parallel distribution, or arbitrage between low-priced and high-priced member states, can further reduce prices. In some countries, we may be required to conduct a clinical trial or other trials that compare the cost-effectiveness of our product candidates to other available therapies in order to obtain or maintain reimbursement or pricing approval. We cannot be sure that such prices and reimbursement will be acceptable to us or our strategic collaborators. Publication of discounts by third-party payors or authorities may lead to further pressure on the prices or reimbursement levels within the country of publication and other countries. If pricing is set at unsatisfactory levels or if reimbursement of our products is unavailable or limited in scope or amount, our revenues from sales by us or our strategic collaborators and the potential profitability of our product candidates in those countries would be negatively affected.

We face substantial competition, and if our competitors develop and market products that are more effective, safer or less expensive than any of our current or future product candidates, our commercial opportunities will be negatively impacted.

The biotechnology and biopharmaceutical industries are characterized by rapidly advancing technologies, intense competition and a strong emphasis on proprietary products. Many third parties compete with us in developing various approaches to cancer therapy. They include pharmaceutical companies, biotechnology companies, academic institutions and other research organizations. Any treatments developed by our competitors could be superior to our product candidates. It is possible that these competitors will succeed in developing technologies that are more effective than our platforms or product candidates or that would render our platforms obsolete, noncompetitive or not economical. We anticipate that we will face increased competition in the future as additional companies enter our market and scientific developments surrounding other cancer therapies continue to accelerate.

We are also aware of multiple companies with ADC technologies that may be competitive to our platforms, and these companies or their partners and collaborators may develop product candidates that compete in the same indications as our current and future product candidates. Multiple companies are also developing ADCs targeting the same biomarkers as we are targeting or that could compete with our Immunosynthen product candidates, albeit with differing immune stimulating approaches. We expect to compete based on our innovative technology and the efficacy, safety and tolerability profile of our ADCs compared to other product candidates, but if our ADCs are not demonstrably superior in these respects, we may not be able to compete effectively. Products we may develop in the future are also likely to face competition from other products and therapies, some of which we may not currently be aware.

Many of our competitors have significantly greater financial resources and expertise in research and development, manufacturing, preclinical studies, conducting clinical trials, obtaining regulatory approval and marketing than we do. In addition, many of these competitors are active in seeking patent protection and licensing arrangements in anticipation of collecting royalties for use of technology that they have developed. Large pharmaceutical companies, in particular, have extensive experience in clinical testing, obtaining marketing approvals, establishing clinical trial sites, recruiting patients and in manufacturing pharmaceutical products and may succeed in discovering, developing and commercializing products in our field before we do. Smaller or early-stage companies may also prove to be significant competitors, particularly through strategic relationships with large and established companies. These third parties compete with us in recruiting and retaining qualified scientific and management personnel, as well as in acquiring technologies complementary to our programs.

In addition, if our product candidates are approved and commercialized, we may face competition from biosimilars. The route to market for biosimilars was established with the passage of the Health Care Reform Act in March 2010. The Biologics Price Competition and Innovation Act of 2009, or BPCIA, establishes a pathway for FDA approval of follow-on biologics and provides 12 years of data exclusivity for reference products. The BPCIA is complex and continues to be interpreted and implemented by the FDA. In addition, government proposals have sought to reduce the 12-year reference product exclusivity period. Further, since the BPCIA was enacted as part of the overall Health Care Reform Act, current litigation challenges to that Act, discussed more in full below, could impact the validity of the BPCIA. As a result, there still remains significant uncertainty as to the ultimate impact, implementation and regulatory interpretation of the BPCIA.

In Europe, the European Medicines Agency, or EMA, has issued guidelines for approving products through an abbreviated pathway, and biosimilars have been approved in Europe. If a biosimilar version of one of our potential products were approved in the United States or Europe, it could have a negative effect on sales and gross profits of the potential product and our financial condition.

With respect to our current and potential future product candidates, we believe that our ability to compete effectively and develop products that can be manufactured cost-effectively and marketed successfully will depend on our ability to:

- advance our technology platforms;
- obtain and maintain intellectual property protection for our technologies and products;
- obtain required government and other public and private approvals on a timely basis;
- attract and retain key personnel;
- commercialize effectively;
- obtain reimbursement for our products in approved indications;
- comply with applicable laws, regulations and regulatory requirements and restrictions with respect to the commercialization of our products, including with respect to any changed or increased regulatory restrictions; and
- enter into additional strategic collaborations to advance the development and commercialization of our product candidates.

Risks Related to Our Intellectual Property

If we are unable to obtain or protect intellectual property rights related to our technology and ADC product candidates, or if our intellectual property rights are inadequate, we may not be able to compete effectively.

Our success depends in large part on our ability to obtain and maintain protection with respect to our intellectual property and proprietary technology. We rely upon a combination of patents, trade secret and confidential know-how protection and confidentiality agreements to protect the intellectual property related to our platforms and our product candidates, including XMT-1660, XMT-2056, XMT-2068 and XMT-2175. The patent position of biopharmaceutical companies is generally uncertain because it involves complex legal and factual considerations and has, in recent years, been the subject of much litigation. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights is highly uncertain. The standards applied by the United States Patent and Trademark Office, or USPTO, and foreign patent offices in granting patents are not always applied uniformly or predictably. For example, there is no uniform worldwide policy regarding patentable subject matter or the scope of claims allowable in patents. In addition, changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection. The patent prosecution process is expensive, complex and time-consuming, and we may not be able to file, prosecute, maintain, enforce or license all necessary or desirable patents and patent applications at a reasonable cost or in a timely manner. It is also possible that we fail to identify patentable aspects of our research and development output before it is too late to obtain patent protection. There is no assurance that all potentially relevant prior art relating to our patents and patent applications has been found. We may be unaware of prior art that could be used to invalidate an issued patent or prevent our pending patent applications from issuing as patents.

The patent applications that we own or in-license may fail to result in issued patents, and even if they do issue as patents, such patents may not cover our platforms and product candidates in the United States or in other countries. The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our patents may be challenged in the courts or patent offices in the United States and abroad. Such challenges may result in loss of exclusivity or in patent claims being narrowed, invalidated or held unenforceable, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and product candidates. For example, even if patent applications we license or own do successfully issue as patents and even if such patents cover our platforms and product candidates, third parties may challenge their validity, enforceability or scope, which may result in such patents being narrowed or invalidated. Furthermore, even if they are unchallenged, our patents and patent applications may not provide adequate protection or exclusivity for our ADC platform or product candidates, prevent others from designing around our claims or otherwise provide us with a competitive advantage. Any of these outcomes could impair our ability to prevent competition from third parties, which may have an adverse impact on our business.

If patent applications we own or have in-licensed with respect to our platforms or our product candidates fail to issue as patents, if their breadth or strength of protection is threatened or inadequate, or if they fail to provide meaningful exclusivity, it could dissuade companies from collaborating with us. We cannot offer any assurances about which, if any, patents will issue, the breadth of any such patents or whether any issued patents will be found invalid and unenforceable or will be threatened by third parties. Any inability to obtain relevant granted patents or successful challenge to these patents or any other patents owned by or licensed to us could deprive us of rights necessary for the successful development and commercialization of any product candidate. Since patent applications in the United States and most other countries are confidential for a period of time after filing, and some remain so until issued, we cannot be certain that we were the first to file any patent application related to a product candidate. Furthermore, with respect to at least certain of our patents and patent applications, if third parties have filed such patent applications, an interference proceeding in the United States can be initiated by the USPTO or a third-party to determine who was the first to invent any of the subject matter covered by the patent claims of our applications. In addition, patents have a limited lifespan. In the United States, the natural expiration of a patent is generally 20 years after it is filed. Various extensions may be available; however, the life of a patent and the protection it affords is limited. Given the amount of time required for the development, testing and regulatory review of new product candidates, our owned or in-licensed patents protecting such candidates might expire before being able to effectively prevent others from commercializing products competitive to our candidates. If we encounter delays in obtaining regulatory approvals, the period of time during which we could market a drug under patent protection could be further reduced. Even if patents covering our product candidates are obtained, once the patent life has expired for a product, we may be open to competition from similar or generic products. The launch of a generic version of one of our products in particular would be likely to result in an immediate and substantial reduction in the demand for our product, which could have a material adverse effect on our business, financial condition, results of operations and prospects.

On September 16, 2011, the Leahy-Smith America Invents Act, or the Leahy-Smith Act, was signed into law. The Leahy-Smith Act includes a number of significant changes to U.S. patent law. These include provisions that affect the way patent applications are prosecuted, redefine prior art, may affect patent litigation and switch the U.S. patent system from a "first-to-invent" system to a "first-inventor-to-file" system. Under a first-inventor-to-file system, assuming the other requirements for patentability are met, the first inventor to file a patent application generally will be entitled to the patent on an invention regardless of whether another inventor had made the invention earlier. These provisions also allow third-party submission of prior art to the USPTO during patent prosecution and set forth additional procedures to attack the validity of a patent by the USPTO administered post grant proceedings. The USPTO developed additional regulations and procedures to govern administration of the Leahy-Smith Act, and many of the substantive changes to patent law associated with the Leahy-Smith Act, and, in particular, the first-inventor-to-file provisions, became effective on March 16, 2013. Accordingly, it is not clear what, if any, impact the Leahy-Smith Act will have on the operation of our business. The Leahy-Smith Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents, all of which could have a material adverse effect on our business, financial condition, results of operations and prospects. Potential further changes to the laws governing intellectual property in the United States or other countries, or in the continued interpretation and implementation of the provisions of the Leahy-Smith Act in the United States, create uncertainty in our ability to obtain, maintain and enforce our intellectual property rights and could have an adverse effect on our ability to do so in a way that protects our platforms and product candidates.

Any loss of patent protection could have a material adverse impact on our business. We may be unable to prevent competitors from entering the market with a product that is similar to or the same as our product candidates.

Issued patents covering XMT-1660, XMT-2056 and any other current or future ADC product candidates could be found not infringed by a competitive product, invalid or unenforceable if challenged in court or before the USPTO or comparable foreign authority.

In some cases, it may be difficult to detect infringement of our intellectual property rights by third parties, and, even if detected, proving infringement may be difficult. If we or one of our licensing partners initiate legal proceedings against a third party to enforce a patent covering XMT-1660, XMT-2056 or any other current or future product candidates, the defendant could counterclaim its product does not infringe the asserted patent or that the patent covering our product candidate is invalid or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace, and there are numerous grounds upon which a third party can assert invalidity or unenforceability of a patent. Grounds for a validity challenge could be, among other things, an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness, lack of written description or non-enablement. Grounds for an unenforceability assertion could be, among other things, 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 also raise similar claims before administrative bodies in the United States or abroad, even outside the context of litigation. Such mechanisms include re-examination, inter partes review, post-grant review, interference proceedings, derivation proceedings and equivalent proceedings in foreign jurisdictions (e.g., opposition proceedings). Such proceedings could result in revocation, cancellation or amendment to our patents in such a way that they no longer cover and protect our product candidates. The outcome following legal assertions of infringement, invalidity and unenforceability is unpredictable. With respect to infringement, the court may interpret the claims in a way that establishes a third-party product does not infringe those claims, or we may be otherwise unsuccessful in establishing that a third-party product embodies or practices each element of the claim and therefore infringes the claim. With respect to the validity of our patents, for example, we cannot be certain that there is no invalidating prior art of which we, our licensors, our patent counsel 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 one or more of our product candidates. Any such loss of patent protection or a finding that a third party's competitive product does not infringe our patents could have a material adverse impact on our business, financial condition, results of operations and prospects.

If we fail to comply with our obligations under any license, strategic collaboration or other agreements, we may be required to pay damages and could lose intellectual property rights that are necessary for developing and protecting our ADC product candidates.

We rely, in part, on license, collaboration and other agreements. We may need to obtain additional licenses from others to advance our research or allow commercialization of our product candidates and it is possible that we may be unable to obtain additional licenses at a reasonable cost or on reasonable terms, if at all. The licensing or acquisition of third party intellectual property rights is a competitive area, and several more established companies may pursue strategies to license or acquire third party intellectual property rights that we may consider attractive. These established companies may have a competitive advantage over us due to their size, capital 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. We also may be unable to license or acquire third-party intellectual property rights on terms that would allow us to make an appropriate return on our investment.

In addition, our existing licenses and collaboration agreements, including our license with Merck KGaA for intellectual property covering the Immunosynthen platform; our potential license with GSK for intellectual property covering XMT-2056; our license with Johnson & Johnson for intellectual property covering the Dolasynthen platform and our license with Synaffix B.V., or Synaffix, for intellectual property covering components included in the Dolasynthen platform, impose, and any future licenses, collaborations or other agreements we enter into are likely to impose, various development, commercialization, funding, milestone, royalty, diligence, sublicensing, insurance, patent prosecution, challenge and enforcement or other obligations on us. If we breach any of these obligations, or use the intellectual property licensed to us in an unauthorized manner, we may be required to pay damages and the licensor may have the right to terminate the license, including, in the case of our agreement with Merck KGaA, the license for the rights covering the Immunosynthen platform; in the case of our agreement with GSK, the potential license for the rights covering XMT-2056; in the case of our agreement with Johnson & Johnson, the license for the rights covering the Dolasynthen platform; and, in the case of our agreement with Synaffix, the license for the rights covering components in the Dolasynthen platform. Any of the foregoing could result in us being unable to develop, manufacture and sell products that are covered by the licensed intellectual property or enable a competitor to gain access to the licensed technology. Disputes may arise regarding intellectual property subject to a licensing, collaboration or other agreements, including:

- the scope of rights granted under the license agreement and other interpretation related issues;
- the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the licensing agreement;
- the sublicensing of patent and other rights under our collaborative development relationships;
- our diligence obligations under the license agreement and what activities satisfy those diligence obligations;
- 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 collaborators; and
- the priority of invention of patented technology.

In addition, the agreements under which we currently license intellectual property or technology to or 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 intellectual property or technology, or increase what we believe to be our financial or other obligations under the relevant agreement, either of which could have a material adverse effect on our business, financial condition, results of operations and prospects. Moreover, if disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on commercially acceptable terms, we may be unable to successfully develop and commercialize the affected product candidates.

In some circumstances, we may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the patents, covering the technology that we license from third parties. Therefore, we cannot be certain that these patents and applications will be prosecuted, maintained and enforced in a manner consistent with the best interests of our business. If our licensors fail to obtain or maintain such intellectual property, or lose rights to such intellectual property, the rights we have licensed and our exclusivity may be reduced or eliminated and our right to develop and commercialize any of our products that are subject to such licensed rights could be adversely affected.

Moreover, our rights to our in-licensed patents and patent applications are dependent, in part, on inter-institutional or other operating agreements between the joint owners of such in-licensed patents and patent applications. If one or more of such joint owners breaches such inter-institutional or operating agreements, our rights to such in-licensed patents and patent applications

may be adversely affected. In addition, while we cannot currently determine the amount of the royalty obligations we would be required to pay on sales of future products, if any, the amounts may be significant. The amount of our future royalty obligations will depend on the technology and intellectual property we use in products that we successfully develop and commercialize, if any. Therefore, even if we successfully develop and commercialize products, we may be unable to achieve or maintain profitability. Any of the foregoing could have a material adverse effect on our competitive position, business, financial conditions, results of operations and prospects.

If we are unable to successfully obtain rights to required third-party intellectual property rights or maintain the existing intellectual property rights we have, we may have to abandon development of the relevant program or product candidate and our business, financial condition, results of operations and prospects could suffer.

We may become involved in lawsuits to protect or enforce our intellectual property or to defend against intellectual property claims, which could be expensive, time consuming and unsuccessful.

Competitors and other third parties may infringe our patents or misappropriate or otherwise violate our owned and in-licensed intellectual property rights. To counter infringement or unauthorized use, litigation or other intellectual property proceedings may be necessary to enforce or defend our owned and in-licensed intellectual property rights, to protect our confidential information and trade secrets or to determine the validity and scope of our own intellectual property rights or the proprietary rights of others. Such litigation or proceedings can be expensive and time consuming, and any such claims could provoke defendants to assert counterclaims against us, including claims alleging that we infringe their patents or other intellectual property rights. We may not have sufficient financial or other resources to adequately conduct such litigation or proceedings. Many of our current and potential competitors have the ability to dedicate substantially greater resources to litigate intellectual property rights than we can and have more mature and developed intellectual property portfolios. Accordingly, despite our efforts, we may not be able to prevent third parties from infringing upon or misappropriating our intellectual property. Even if resolved in our favor, litigation or other intellectual property proceedings could result in substantial costs and diversion of management attention and resources, which could harm our business and financial results.

In addition, in a litigation or other proceeding, a court or administrative judge may decide that a patent owned by or licensed to us is invalid or unenforceable, or a court may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover the technology in question. An adverse result in any litigation or other proceeding could put one or more of our patents at risk of being invalidated, held unenforceable or interpreted narrowly. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation and other proceedings, there is a risk that some of our confidential information could be compromised by disclosure during this type of litigation. During the course of any patent or other intellectual property litigation or other proceeding, there could be public announcements of the results of hearings, rulings on motions and other interim proceedings or developments and if securities analysts or investors regard these announcements as negative, the perceived value of our product candidates, programs or intellectual property could be diminished. Accordingly, the market price of our common stock may decline. Any of the foregoing could have a material adverse effect on our business, financial conditions, results of operations and prospects.

Third-party claims of intellectual property infringement or misappropriation may prevent or delay our development and commercialization efforts.

Our commercial success depends in part on our ability and the ability of our strategic collaborators to develop, manufacture, market and sell product candidates and use our proprietary technologies without infringing, misappropriating or otherwise violating the patents and proprietary rights of third parties. There is a substantial amount of litigation, both within and outside the United States, involving patent and other intellectual property rights in the biopharmaceutical industries, including patent infringement lawsuits, interferences, oppositions, reexamination, inter partes review, derivation and post grant review proceedings before the USPTO and corresponding foreign patent offices. Numerous U.S. and foreign issued patents and pending patent applications owned by third parties exist in the fields in which we are developing and may develop our product candidates. As the biopharmaceutical industries expand and more patents are issued, the risk increases that our product candidates may be subject to claims of infringement of the patent rights of third parties.

Third parties may assert that we, our customers, licensees or parties indemnified by us are employing their proprietary technology without authorization or have infringed upon, misappropriated or otherwise violated their intellectual property or other rights, regardless of their merit. For example, we may be subject to claims that we are infringing the patent, trademark or copyright rights of third parties, or that our employees have misappropriated or divulged their former employers' trade secrets or confidential information. There may be third-party patents or patent applications with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of our product candidates, that we failed to identify. For example, applications filed before November 29, 2000 and certain applications filed after that date that will not be filed outside the United States remain confidential until issued as patents. Except for certain exceptions, including the preceding exceptions, patent applications in the United States and elsewhere are generally published only after a waiting period of approximately 18 months after the earliest filing, and sometimes not at all. Therefore, patent applications covering our platforms or our product candidates could have been filed by others without our knowledge. Additionally, pending patent applications which have been published can, subject to certain limitations, be later amended in a manner that could cover our platforms, our product candidates or the use or manufacture of our product candidates.

Even if we believe a third party's claims against us are without merit, a court of competent jurisdiction could hold that such third party's patent is valid, enforceable and covers aspects of our product candidates, including the materials, formulations, methods of manufacture, methods of analysis, or methods for treatment, in which case, such third party would be able to block our ability to develop and commercialize the applicable technology or product candidate until such patent expired or unless we obtain a license and we may be required to pay such third-party monetary damages, which could be substantial. Such licenses may not be available on acceptable terms, if at all. Even if we were able to obtain a license, the rights may be nonexclusive, which could result in our competitors gaining access to the same intellectual property and it could require us to make substantial licensing and royalty payments. Ultimately, we could be prevented from commercializing a product, or be forced to cease some aspect of our business operations, if, as a result of actual or threatened patent infringement claims, we are unable to enter into licenses on acceptable terms.

Parties making claims against us may also obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize our technologies or one or more of our product candidates. Defending against claims of patent infringement, misappropriation of trade secrets or other violations of intellectual property could be costly and time consuming, regardless of the outcome. Thus, even if we were to ultimately prevail, or to settle at an early stage, such litigation could burden us with substantial unanticipated costs. In addition, litigation or threatened litigation could result in significant demands on the time and attention of our management team, distracting them from the pursuit of other company business. In the event of a successful claim of infringement against us, in addition to potential injunctive relief, we may have to pay substantial damages, including treble damages and attorneys' fees for willful infringement, pay royalties, redesign our infringing products or obtain one or more licenses from third parties, which may be impossible or require substantial time and monetary expenditure.

We may face a claim of misappropriation if a third party believes that we inappropriately obtained and used confidential information or trade secrets of such third party. If we are found to have misappropriated a third party's confidential information or trade secrets, we may be prevented from further using such confidential information or trade secrets, limiting our ability to develop our product candidates, we may be required to obtain a license to such confidential information, which may not be available on commercially reasonable terms or at all and may be non-exclusive, and we may be required to pay damages, which could be substantial. Any of the foregoing could have a material adverse effect on our 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 product candidates in all countries throughout the world where we expect there to be significant markets for our products could be prohibitively expensive, and the laws of foreign countries may not protect our rights to the same extent as the laws of the United States. In addition, our intellectual property license agreements may not always include worldwide rights. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States. Competitors may use our technologies 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 or licenses but enforcement is not as strong as that in the United States. These products may compete with our products, and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Additionally, the laws of some foreign countries do not protect intellectual property rights to the same extent as the laws of the United States, and many companies have encountered significant problems in protecting and defending such rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do not favor the enforcement of patents and other intellectual property protection, particularly those relating to biotechnology, which could make it difficult for

us to stop the infringement of our licensed and owned patents or marketing of competing products in violation of our intellectual property and proprietary rights generally. 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 patents at risk of being invalidated or interpreted narrowly, could put our patent applications at risk of not issuing as patents, 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 or license.

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 or any of our licensors is 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.

Confidentiality agreements with employees and third parties may not prevent unauthorized disclosure of trade secrets and other proprietary information.

In addition to the protection afforded by patents, we rely on protection of our confidential know-how, including through trade secret protection and confidentiality agreements to protect proprietary know-how that is not patentable or that we elect not to patent, processes for which patents are difficult to enforce and any other elements of our platform technology and discovery and development processes that involve proprietary know-how, information or technology that is not covered by patents. However, confidential know-how, including trade secrets, can be difficult to protect. We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with our employees, consultants and outside scientific advisors, contractors and collaborators. We cannot guarantee that we have entered into such agreement with each party that may have or have had access to our trade secrets or proprietary technology and processes. Additionally, our confidentiality agreements and other contractual protections may not be adequate to protect our intellectual property from unauthorized disclosure, third-party infringement or misappropriation. We may not have adequate remedies in the case of a breach of any such agreements, and our trade secrets and other proprietary information could be disclosed to our competitors or others may independently develop substantially equivalent or superior proprietary information and techniques or otherwise gain access to our trade secrets or disclose such technologies.

Enforcing a claim that a third party illegally obtained and is using any of our confidential know-how or trade secrets is expensive and time consuming, and the outcome is unpredictable. In addition, some courts outside and within the United States sometimes are less willing to protect trade secrets. Misappropriation or unauthorized disclosure of our confidential know-how and trade secrets could impair our competitive position and may have a material adverse effect on our business.

We may be subject to claims by third parties asserting that our licensors, employees, consultants, advisors or we have misappropriated their intellectual property, or claiming ownership of what we regard as our own intellectual property.

Many of our and our licensors' employees, including our senior management, consultants or advisors are currently, or previously were, employed at universities or other biotechnology or pharmaceutical companies, including our competitors or potential competitors. Some of these employees, including members of our senior management, executed proprietary rights, non-disclosure and non-competition agreements, or similar agreements, in connection with such previous employment. 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 such claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel or sustain damages. Such intellectual property rights could be awarded to a third party, and we could be required to obtain a license from such third party to commercialize our technology or products. Such a license may not be available on commercially reasonable terms or at all. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management. Any of the foregoing may have a material adverse effect on our business, financial condition, results of operations and prospects.

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.

If we do not obtain patent term extension and data exclusivity for any product candidates we may develop, our business may be materially harmed.

Depending upon the timing, duration and specifics of any FDA marketing approval of any product candidates we may develop, one or more of our owned or in-licensed U.S. patents may be eligible for limited patent term extensions, for example, in the United States under the Drug Price Competition and Patent Term Restoration Act of 1984, or Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit a patent term extension of up to five years as compensation for the 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. 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 the 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.

In addition to patent and other intellectual property protection, we may seek market and data exclusivity for our biological product candidates subject to the biologics license application, or BLA, process at the FDA, which is currently 12 years in the United States, 10 years in Europe and other durations in other countries, where available. The term of the patents covering our product candidates may not extend beyond the data and market exclusivities. There is a risk that this data and market exclusivity could be shortened due to legislative action in the United States or other countries where such protection is currently available, potentially creating the risk that biosimilar competition could enter the market sooner than anticipated. In addition, the extent to which any biosimilar competitive product, once approved, may be substituted for our relevant reference product is not yet clear, and will depend on many market and regulatory factors which are uncertain.

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.

Periodic maintenance fees, renewal fees, annuity fees and various other government fees on patents and patent 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 U.S. and non-U.S. patent agencies. The USPTO and various non-U.S. government agencies require compliance with several procedural, documentary, fee payment and other similar provisions during the patent application process. We are also dependent on our licensors to take the necessary action to comply with these requirements with respect to our licensed intellectual property. 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.

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 ADC products that are similar to any product candidates we may develop or utilize similar ADC-related technology but that are not covered by the claims of the patents that we license or may own in the future;
- we, or our license partners or current or future strategic collaborators, might not have been the first to make the inventions covered by the issued patent or pending patent application that we license or may own in the future;
- we, or our license partners or current or future strategic collaborators, might not have been the first to file patent applications covering certain of our or their inventions;

- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our owned or licensed intellectual property rights;

- it is possible that our pending licensed patent applications or those that we may own in the future will not lead to issued patents;

- issued patents that we hold rights to may be held invalid or unenforceable, including as a result of legal challenges by our competitors;

- our competitors 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;

- the patents of others may harm our business; and

- we may choose not to file a patent in order to maintain certain trade secrets or confidential know how, and a third party may subsequently file a patent covering such intellectual property.

Should any of these events occur, they could have a material adverse effect on our business, financial condition, results of operations and prospects.

Risks Related to Regulatory Approval and Other Legal Compliance Matters

Even if we complete the necessary preclinical studies and clinical trials, the regulatory approval process is expensive, time consuming and uncertain and may prevent us from obtaining approvals for the commercialization of some or all of our product candidates. As a result, we cannot predict when or if, and in which territories, we will obtain marketing approval to commercialize a product candidate.

The research, testing, manufacturing, labeling, approval, selling, marketing, promotion and distribution of products are subject to extensive regulation by the FDA and comparable foreign regulatory authorities. We are not permitted to market our product candidates in the United States or in other countries until we receive approval of a BLA from the FDA or marketing approval from applicable regulatory authorities outside the United States. Our product candidates are in various stages of development and are subject to the risks of failure inherent in development. We have not submitted an application for or received marketing approval for any of our product candidates in the United States or in any other jurisdiction. Additionally, we have no experience as a company in filing and supporting the applications necessary to gain marketing approvals and expect to rely on third-party CROs to assist us in this process.

The process of obtaining marketing approvals, both in the United States and abroad, is lengthy, expensive and uncertain. It may take many years, if approval is obtained at all, and can vary substantially based upon a variety of factors, including the type, complexity and novelty of the product candidates involved. Securing marketing approval requires the submission of extensive preclinical and clinical data and supporting information, including manufacturing information, to regulatory authorities for each therapeutic indication to establish the product candidate's safety and efficacy. The FDA or other regulatory authorities may determine that our product candidates are not safe and effective, only moderately effective or have undesirable or unintended side effects, toxicities or other characteristics that preclude our obtaining marketing approval or prevent or limit commercial use.

Further, under the Pediatric Research Equity Act, or PREA, a BLA or supplement to a BLA for certain biological products must contain data to assess the safety and effectiveness of the biological product in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective, unless the sponsor receives a deferral or waiver from the FDA. A deferral may be granted for several reasons, including a finding that the product or therapeutic candidate is ready for approval for use in adults before pediatric trials are complete or that additional safety or effectiveness data needs to be collected before the pediatric trials begin. The applicable legislation in the European Union also requires sponsors to either conduct clinical trials in a pediatric population in accordance with a Pediatric Investigation Plan approved by the Pediatric Committee of the EMA or to obtain a waiver or deferral from the conduct of these studies by this Committee. For any of our product candidates for which we are seeking regulatory approval in the United States or the European Union, we cannot guarantee that we will be able to obtain a waiver or alternatively complete any required

studies and other requirements in a timely manner, or at all, which could result in associated reputational harm and subject us to enforcement action.

In addition, changes in marketing approval policies during the development period, changes in or the enactment or promulgation of additional statutes, regulations or guidance or changes in regulatory review for each submitted product application, may cause delays in the approval or rejection of an application. For example, in December 2022, with the passage of FDORA, Congress required sponsors to develop and submit a diversity action plan for each Phase 3 clinical trial or any other "pivotal study" of a new drug or biological product. These plans are meant to encourage the enrollment of more diverse patient populations in late-stage clinical trials of FDA-regulated products. Further, in January 2022, the new Clinical Trials Regulation (EU) No 536/2014 became effective in the European Union and replaced the prior Clinical Trials Directive 2001/20/EC. This regulation aims at simplifying and streamlining the authorization, conduct and transparency of clinical trials in the European Union. Under the coordinated procedure for the approval of clinical trials, the sponsor of a clinical trial to be conducted in more than one EU Member State will only be required to submit a single application for approval. The submission will be made through the Clinical Trials Information System, a clinical trials portal overseen by the EMA and available to clinical trial sponsors, competent authorities of the EU Member States and the public.

Regulatory authorities have substantial discretion in the approval process and varying interpretations of the data obtained from preclinical and clinical testing could delay, limit or prevent marketing approval of a product candidate. Any marketing approval we ultimately obtain may be limited or subject to restrictions or post-approval commitments that render the approved product not commercially viable.

Failure to obtain marketing approval in foreign jurisdictions would prevent our product candidates from being marketed abroad. Any approval we may be granted for our product candidates in the United States would not assure approval of our product candidates in foreign jurisdictions and any of our product candidates that may be approved for marketing in a foreign jurisdiction will be subject to risks associated with foreign operations.

We intend to market our current product candidates, XMT-1660 and XMT-2056, if approved, in international markets either directly or through collaborations. In order to market and sell our products in the European Union and other foreign jurisdictions, we must obtain separate marketing approvals and comply with numerous and varying regulatory requirements. The approval procedure varies among countries and can involve additional testing. The time required to obtain approval may differ substantially from that required to obtain FDA approval. The marketing approval process outside the United States generally includes all of the risks associated with obtaining FDA approval. We may not obtain approvals from regulatory authorities outside the United States on a timely basis, if at all. Approval by the FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one regulatory authority outside the United States does not ensure approval by regulatory authorities in other countries or jurisdictions or by the FDA. We may file for marketing approvals but not receive necessary approvals to commercialize our products in any market.

In many countries outside the United States, a product candidate must also be approved for reimbursement before it can be sold in that country. In some cases, the price that we intend to charge for our products, if approved, is also subject to approval. Obtaining non-U.S. regulatory approvals and compliance with non-U.S. regulatory requirements could result in significant delays, difficulties and costs for us and could delay or prevent the introduction of our product candidates in certain countries. In addition, if we fail to obtain the non-U.S. approvals required to market our product candidates outside the United States or if we fail to comply with applicable non-U.S. regulatory requirements, our target markets will be reduced and our ability to realize the full market potential of our product candidates will be harmed and our business, financial condition, results of operations and prospects may be adversely affected.

Additionally, we could face heightened risks with respect to obtaining marketing authorization in the United Kingdom as a result of the withdrawal of the United Kingdom from the European Union, commonly referred to as Brexit. The United Kingdom is no longer part of the European Single Market and EU Customs Union. As of January 1, 2021, the Medicines and Healthcare products Regulatory Agency, or MHRA, became responsible for supervising medicines and medical devices in Great Britain, comprising England, Scotland and Wales under domestic law, whereas under the terms of the Northern Ireland Protocol, Northern Ireland is currently subject to European Union rules. The United Kingdom and the European Union have, however, agreed to the Windsor Framework, which fundamentally changes the existing system under the Northern Ireland Protocol, including with respect to the regulation of medicinal products in the United Kingdom. Once implemented, the changes introduced by the Windsor Framework will see the MHRA be responsible for approving all medicinal products destined for the United Kingdom market (i.e., Great Britain and Northern Ireland), and the EMA will no longer have any role in approving medicinal products destined for Northern Ireland. Any delay in obtaining, or an inability to obtain, any marketing

authorizations, as a result of Brexit or otherwise, may force us to restrict or delay efforts to seek regulatory approval in the United Kingdom for our product candidates, which could significantly and materially harm our business.

In addition, foreign regulatory authorities may change their approval policies and new regulations may be enacted. For instance, the European Union pharmaceutical legislation is currently undergoing a complete review process, in the context of the Pharmaceutical Strategy for Europe initiative, launched by the European Commission in November 2020. The European Commission's proposal for revision of several legislative instruments related to medicinal products (potentially reducing the duration of regulatory data protection, revising the eligibility for expedited pathways, etc.) was published on April 26, 2023. The proposed revisions remain to be agreed and adopted by the European Parliament and European Council, and the proposals may, therefore, be substantially revised before adoption, which is not anticipated before early 2026. The revisions may, however, have a significant impact on the pharmaceutical industry and our business in the long term.

We expect that we will be subject to additional risks in commercializing any of our product candidates that receive marketing approval outside the United States, including 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; and workforce uncertainty in countries where labor unrest is more common than in the United States.

We plan to conduct clinical trials at sites outside the United States. The FDA may not accept data from trials conducted in such locations, and the conduct of trials outside the United States could subject us to additional delays and expense.

We plan to conduct one or more clinical trials with one or more trial sites that are located outside the United States. The acceptance by the FDA or other regulatory authorities of study data from clinical trials conducted outside their jurisdiction 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 United States population and United States 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 study data are not intended to serve as the sole basis for approval, the FDA will not accept the data as support for an application for marketing approval unless the study is well-designed and well-conducted in accordance with GCP requirements and the FDA is able to validate the data from the study 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 U.S. 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;
- cultural differences in medical practice and clinical research;
- diminished protection of intellectual property in some countries; and
- interruptions or delays in our trials resulting from geopolitical events, such as war or terrorism.

Any regulatory approval to market our products will be limited by indication. If we fail to comply or are found to be in violation of FDA regulations restricting the promotion of our products for unapproved uses, we could be subject to criminal penalties, substantial fines or other sanctions and damage awards.

The regulations relating to the promotion of products for unapproved uses are complex and subject to substantial interpretation by the FDA, EMA, MHRA and other government agencies. In September 2021, the FDA published final regulations which describe the types of evidence that the agency will consider in determining the intended use of a drug product. Physicians may nevertheless prescribe our products off-label to their patients in a manner that is inconsistent with the approved label. We intend to implement compliance and training programs designed to ensure that our sales and marketing practices comply with applicable regulations. Notwithstanding these programs, the FDA or other government agencies may allege or find that our practices constitute prohibited promotion of our products for unapproved uses. We also cannot be sure that our employees will comply with company policies and applicable regulations regarding the promotion of products for unapproved uses.

Notwithstanding the regulatory restrictions on off-label promotion, the FDA and other regulatory authorities allow companies to engage in truthful, non-misleading, and non-promotional scientific communications concerning their products in certain circumstances. For example, in October 2023, the FDA published draft guidance outlining the agency's non-binding policies governing the distribution of scientific information on unapproved uses to healthcare providers. This draft guidance calls for such communications to be truthful, non-misleading, factual, and unbiased and include all information necessary for healthcare providers to interpret the strengths and weaknesses and validity and utility of the information about the unapproved use. In addition, under some relatively recent guidance from the FDA and the Pre-Approval Information Exchange Act, or PIE Act, signed into law as part of the Consolidated Appropriations Act of 2023, companies may also promote information that is consistent with the prescribing information and proactively speak to formulary committee members of payors regarding data for an unapproved drug or unapproved uses of an approved drug. We may engage in these discussions and communicate with healthcare providers, payors and other constituencies in compliance with all applicable laws, regulatory guidance and industry best practices. We will need to carefully navigate the FDA's various regulations, guidance and policies, along with recently enacted legislation, to ensure compliance with restrictions governing promotion of our products.

In recent years, a significant number of pharmaceutical and biotechnology companies have been the target of inquiries and investigations by various federal and state regulatory, investigative, prosecutorial and administrative entities in connection with the promotion of products for unapproved uses and other sales practices, including the Department of Justice and various U.S. Attorneys' Offices, the Office of Inspector General of the Department of Health and Human Services, the FDA, the Federal Trade Commission, or the FTC, and various state Attorneys General offices. These investigations have alleged violations of various federal and state laws and regulations, including claims asserting antitrust violations, violations of the FDCA, the False Claims Act, the Prescription Drug Marketing Act and anti-kickback laws and other alleged violations in connection with the promotion of products for unapproved uses, pricing and Medicare and/or Medicaid reimbursement. Many of these investigations originate as "*qui tam*" actions under the False Claims Act. Under the False Claims Act, any individual can bring a claim on behalf of the government alleging that a person or entity has presented a false claim or caused a false claim to be submitted to the government for payment. The person bringing a *qui tam* suit is entitled to a share of any recovery or settlement. *Qui tam* suits, also commonly referred to as "whistleblower suits," are often brought by current or former employees. In a *qui tam* suit, the government must decide whether to intervene and prosecute the case. If it declines, the individual may pursue the case alone.

If the FDA or any other governmental agency initiates an enforcement action against us or if we are the subject of a *qui tam* suit and it is determined that we violated prohibitions relating to the promotion of products for unapproved uses, we could be subject to substantial civil or criminal fines or damage awards and other sanctions such as consent decrees and corporate integrity agreements pursuant to which our activities would be subject to ongoing scrutiny and monitoring to ensure compliance with applicable laws and regulations. Any such fines, awards or other sanctions would have an adverse effect on our revenue, business, financial prospects and reputation.

Any product for which we obtain marketing approval in the future could be subject to post-marketing restrictions or withdrawal from the market and we may be subject to substantial penalties if we fail to comply with regulatory requirements or if we experience unanticipated problems with any such product following approval.

Any product for which we obtain marketing approval, as well as the manufacturing processes, post-approval studies and measures, labeling, advertising and promotional activities for such product, among other things, will be subject to ongoing requirements of and review by the FDA and other regulatory authorities. These requirements include submissions of safety and other post-marketing information and reports, registration and listing requirements, requirements relating to manufacturing, quality control, quality assurance and corresponding maintenance of records and documents, requirements regarding the distribution of samples to physicians and recordkeeping. Even if marketing approval of a product is granted, the approval may be subject to limitations on the indicated uses for which the product may be marketed or to the conditions of approval, including the requirement to implement a REMS.

The FDA may also impose requirements for costly post-marketing studies or clinical trials and surveillance to monitor the safety or efficacy of a product. The FDA and other agencies, including the Department of Justice, closely regulate and monitor the post-approval marketing and promotion of products to ensure that they are manufactured, marketed and distributed only for the approved indications and in accordance with the provisions of the approved labeling. The FDA imposes stringent restrictions on manufacturers' communications regarding off-label use and if we market any product for an indication that is not approved, we may be subject to warnings or enforcement action for off-label marketing. Violation of the FDCA and other statutes, including the False Claims Act, relating to the promotion and advertising of prescription drugs may lead to investigations or allegations of violations of federal and state health care fraud and abuse laws and state consumer protection laws.

In addition, later discovery of previously unknown adverse events or other problems with any product for which we may obtain marketing approval and its manufacturers or manufacturing processes or failure to comply with regulatory requirements, may yield various results, including:

- restrictions on such product, manufacturers or manufacturing processes;
- restrictions on the labeling or marketing of the product;
- restrictions on product distribution or use;
- requirements to conduct post-marketing studies or clinical trials;
- warning letters or untitled letters;
- withdrawal of the product from the market;
- refusal to approve pending applications or supplements to approved applications that we submit;
- recall of the product;
- restrictions on coverage by third-party payors;
- fines, restitution or disgorgement of profits or revenues;
- suspension or withdrawal of marketing approvals;
- refusal to permit the import or export of the product;
- product seizure; or
- injunctions or the imposition of civil or criminal penalties.

Finally, our ability to develop and market new drug products may be impacted by ongoing litigation challenging the FDA's approval of mifepristone. Specifically, on April 7, 2023, the U.S. District Court for the Northern District of Texas stayed the approval by the FDA of mifepristone, a drug product which was originally approved in 2000 and whose distribution is governed by various conditions adopted under a REMS. In reaching that decision, the district court made a number of findings that may negatively impact the development, approval and distribution of drug products in the U.S. Among other determinations, the district court held that plaintiffs were likely to prevail in their claim that FDA had acted arbitrarily and capriciously in approving mifepristone without sufficiently considering evidence bearing on whether the drug was safe to use under the conditions identified in its labeling. Further, the district court read the standing requirements governing litigation in federal court as permitting a plaintiff to bring a lawsuit against the FDA in connection with its decision to approve an NDA or establish requirements under a REMS based on a showing that the plaintiff or its members would be harmed to the extent that FDA's drug approval decision effectively compelled the plaintiffs to provide care for patients suffering adverse events caused by a given drug.

On April 12, 2023, the district court decision was stayed, in part, by the U.S. Court of Appeals for the Fifth Circuit. Thereafter, on April 21, 2023, the U.S. Supreme Court entered a stay of the district court's decision, in its entirety, pending disposition of the appeal of the district court decision in the Court of Appeals for the Fifth Circuit and the disposition of any petition for a writ of certiorari to or the Supreme Court. The Court of Appeals for the Fifth Circuit held oral argument in the case on May 17, 2023 and, on August 16, 2023, issued its decision. The court declined to order the removal of mifepristone from the market, finding that a challenge to the FDA's initial approval in 2000 is barred by the statute of limitations. But the Appeals Court did hold that plaintiffs were likely to prevail in their claim that changes allowing for expanded access of mifepristone that FDA authorized in 2016 and 2021 were arbitrary and capricious. On September 8, 2023, the Justice Department and a manufacturer of mifepristone filed petitions for a writ of certiorari, requesting that asked the U.S. Supreme Court to review the Appeals Court decision. On December 13, 2023, the Supreme Court granted these petitions for writ of certiorari for the appeals court decision.

Similar restrictions apply to the approval of our products in the European Union. The holder of a marketing authorization is required to comply with a range of requirements applicable to the manufacturing, marketing, promotion and sale of medicinal products. These include: compliance with the European Union's stringent pharmacovigilance or safety reporting rules, which can impose post-authorization studies and additional monitoring obligations; the manufacturing of authorized medicinal products, for which a separate manufacturer's license is mandatory; and the marketing and promotion of authorized drugs, which are strictly regulated in the European Union and are also subject to EU Member State laws. The failure to comply with these and other EU requirements can also lead to significant penalties and sanctions.

Accordingly, assuming we, or our collaborators, receive marketing approval for one or more of our product candidates, we, and our collaborators, and our and their contract manufacturers will continue to expend time, money and effort in all areas of regulatory compliance, including manufacturing, production, product surveillance and quality control. If we, and our collaborators, are not able to comply with post-approval regulatory requirements, our or our collaborators' ability to market any future products could be limited, which could adversely affect our ability to achieve or sustain profitability. Further, the cost of compliance with post-approval regulations may have a negative effect on our operating results and financial condition.

We may seek certain designations for our product candidates, including but not limited to Breakthrough Therapy, Fast Track and Priority Review designations in the United States, and PRIority Medicines, or PRIME, Designation in the European Union, but we might not receive such designations, and even if we do, such designations may not lead to a faster development or regulatory review or approval process.

We have in the past sought and may also in the future seek certain designations for one or more of our product candidates that could expedite review and approval by the FDA. A Breakthrough Therapy product is defined as a product that is intended, alone or in combination with one or more other products, to treat a serious condition, and preliminary clinical evidence indicates that the product may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. For products that have been designated as Breakthrough Therapies, interaction and communication between the FDA and the sponsor of the trial can help to identify the most efficient path for clinical development while minimizing the number of patients placed in ineffective control regimens.

The FDA may also designate a product for Fast Track review if it is intended, whether alone or in combination with one or more other products, for the treatment of a serious or life threatening disease or condition, and it demonstrates the potential to address unmet medical needs for such a disease or condition. For Fast Track products, sponsors may have greater interactions with the FDA and the FDA may initiate review of sections of a Fast Track product's application before the application is complete. This rolling review may be available if the FDA determines, after preliminary evaluation of clinical data submitted by the sponsor, that a Fast Track product may be effective. The FDA has granted Fast Track designation for XMT-1660 for the treatment of adult patients with advanced or metastatic triple-negative breast cancer.

We may also seek a priority review designation for one or more of our product candidates. If the FDA determines that a product candidate offers major advances in treatment or provides a treatment where no adequate therapy exists, the FDA may designate the product candidate for priority review. A priority review designation means that the goal for the FDA to review an application is six months, rather than the standard review period of ten months.

These designations are within the discretion of the FDA. Accordingly, even if we believe that one of our product candidates meets the criteria for these designations, the FDA may disagree and instead determine not to make such designation. Further, even if we receive a designation, the receipt of such designation for a product candidate may not result in a faster development or regulatory review or approval process compared to products considered for approval under conventional FDA procedures and does not assure ultimate approval by the FDA. In addition, even if one or more of our product candidates qualifies for these designations, the FDA may later decide that the product candidates no longer meet the conditions for qualification or decide that the time period for FDA review or approval will not be shortened.

In the European Union, we may seek PRIME designation for our product candidates in the future. PRIME is a voluntary program aimed at enhancing the EMA's role to reinforce scientific and regulatory support in order to optimize development and enable accelerated assessment of new medicines that are of major public health interest with the potential to address unmet medical needs. The program focuses on medicines that target conditions for which there exists no satisfactory method of treatment in the European Union or even if such a method exists, it may offer a major therapeutic advantage over existing treatments. PRIME is limited to medicines under development and not authorized in the European Union, and the applicant intends to apply for an initial marketing authorization application through the centralized procedure. To be accepted for PRIME, a product candidate must meet the eligibility criteria in respect of its major public health interest and therapeutic innovation based on information that is capable of substantiating the claims.

The benefits of a PRIME designation include the appointment of a Committee for Medicinal Products for Human Use, or CHMP, rapporteur to provide continued support and help to build knowledge ahead of a marketing authorization application, early dialogue and scientific advice at key development milestones, and the potential to qualify products for accelerated review, meaning reduction in the review time for an opinion on approvability to be issued earlier in the application process. PRIME enables an applicant to request parallel EMA scientific advice and health technology assessment advice to facilitate timely market access. Even if we receive PRIME designation for any of our product candidates, the designation may not result in a materially faster development process, review or approval compared to conventional EMA procedures. Further, obtaining PRIME designation does not assure or increase the likelihood of EMA's grant of a marketing authorization.

We have received an orphan drug designation for XMT-2056, but we may not be able to obtain orphan drug exclusivity for any additional product candidates, and even if we do, that exclusivity may not prevent the FDA or EMA from approving other competing products.

Under the Orphan Drug Act, the FDA may designate a product as an orphan drug if it is a drug or biologic intended to treat a rare disease or condition. A similar regulatory scheme governs approval of orphan products by the EMA in the European Union. Generally, if a product candidate with an orphan drug designation subsequently receives the first marketing approval for the indication for which it has such designation, the product is entitled to a period of marketing exclusivity, which precludes the FDA or EMA from approving another marketing application for the same product for the same therapeutic indication for that time period. The applicable period is seven years in the United States and ten years in the European Union. The exclusivity period in the European Union can be reduced to six years if a product no longer meets the criteria for orphan drug designation, in particular if the product is sufficiently profitable so that market exclusivity is no longer justified.

In order for the FDA to grant orphan drug exclusivity to one of our products, the agency must find that the product is indicated for the treatment of a condition or disease with a patient population of fewer than 200,000 individuals annually in the United States. The FDA may conclude that the condition or disease for which we seek orphan drug exclusivity does not meet this standard. Even if we obtain orphan drug exclusivity for a product, that exclusivity may not effectively protect the product from competition because different products can be approved for the same condition. In particular, the concept of what constitutes the "same drug" for purposes of orphan drug exclusivity remains in flux in the context of gene therapies, and the FDA issued final guidance suggesting that it would not consider two genetic medicine products to be different drugs solely based on minor differences in the transgenes or vectors within a given vector class. In addition, even after an orphan drug is approved, the FDA can subsequently approve the same product for the same condition if the FDA concludes that the later product is clinically superior in that 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 or EMA determines that the request for designation was materially defective or if the manufacturer is unable to assure sufficient quantity of the product to meet the needs of the patients with the rare disease or condition. In May 2022, the FDA granted orphan drug designation to XMT-2056 for the treatment of patients with gastric cancer, but we may not be able to obtain orphan drug exclusivity for any additional product candidates in the future.

In 2017, Congress passed FDA Reauthorization Act of 2017, or FDARA. FDARA, among other things, codified the FDA's pre-existing regulatory interpretation, to require that a drug sponsor demonstrate the clinical superiority of an orphan drug that is otherwise the same as a previously approved drug for the same rare disease in order to receive orphan drug exclusivity. Under Omnibus legislation signed by President Trump on December 27, 2020, the requirement for a product to show clinical superiority applies to drugs and biologics that received orphan drug designation before enactment of FDARA in 2017 but have not yet been approved or licensed by the FDA.

The FDA and Congress may further reevaluate the Orphan Drug Act and its regulations and policies. This may be particularly true in light of a decision from the Court of Appeals for the 11th Circuit in September 2021 finding that, for the purpose of determining the scope of exclusivity, the term "same disease or condition" means the designated "rare disease or condition" and could not be interpreted by the FDA to mean the "indication or use." The court concluded that orphan drug exclusivity applies

to the entire designated disease or condition rather than the "indication or use." Although there have been legislative proposals to overrule this decision, they have not been enacted into law. On January 23, 2023, the FDA announced that, in matters beyond the scope of that court order, the FDA will continue to apply its existing regulations tying orphan-drug exclusivity to the uses or indications for which the orphan drug was approved. We do not know if, when, or how the FDA or Congress may change the orphan drug regulations and policies in the future, and it is uncertain how any changes might affect our business. Depending on what changes the FDA may make to its orphan drug regulations and policies, we may lose any expected benefits of the orphan drug designation we have received for XMT-2056, and our business could be adversely impacted.

Inadequate funding for the FDA, the SEC and other government agencies, including from government shut downs, or other disruptions to these agencies' operations, could hinder their ability to hire and retain key leadership and other personnel, prevent new products and services from being developed or commercialized in a timely manner or otherwise prevent those agencies from performing normal business functions on which the operation of our business may rely, which could negatively impact our business.

The ability of the FDA to review and approve new products can be affected by a variety of factors, including government budget and funding levels, ability to hire and retain key personnel and accept the payment of user fees, and statutory, regulatory and policy changes. Average review times at the agency have fluctuated in recent years as a result. Disruptions at the FDA and other agencies may also slow the time necessary for new product candidates to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. In addition, government funding of the SEC and other government agencies on which our operations may rely, including those that fund research and development activities, is subject to the political process, which is inherently fluid and unpredictable.

Disruptions at the FDA, EMA and other agencies may also slow the time necessary for new drugs to be reviewed and/or approved by necessary government agencies, which would adversely affect our business. For example, in recent years, including in 2018 and 2019, the U.S. government shut down several times and certain regulatory agencies, such as the FDA and the SEC, had to furlough critical employees and stop critical activities.

In addition, disruptions may result from events similar to the COVID-19 pandemic. During the COVID-19 pandemic, a number of companies announced receipt of complete response letters due to the FDA's inability to complete required inspections for their applications. In the event of a similar public health emergency in the future, the FDA may not be able to continue its current pace and review timelines could be extended. Regulatory authorities outside the United States facing similar circumstances may adopt similar restrictions or other policy measures in response to a similar public health emergency and may also experience delays in their regulatory activities.

Accordingly, if a prolonged government shutdown or other disruption occurs, it could significantly impact the ability of the FDA to timely review and process our regulatory submissions, which could have a material adverse effect on our business. Future shutdowns or other disruptions could also affect other government agencies such as the SEC, which may also impact our business by delaying review of our public filings, to the extent such review is necessary, and our ability to access the public markets.

Accelerated approval by the FDA, even if granted for any of our current or future product candidates, may not lead to a faster development or regulatory review or approval process and it does not increase the likelihood that our product candidates will receive marketing approval.

We may seek approval of any of our current and future product candidates using the FDA's accelerated approval pathway. A product may be eligible for accelerated approval if it treats a serious or life-threatening condition, generally provides a meaningful advantage over available therapies, and demonstrates an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit. The FDA or other applicable regulatory agency makes the determination regarding whether a surrogate endpoint is reasonably likely to predict long-term clinical benefit.

Prior to seeking such accelerated approval, we will seek feedback from the FDA and otherwise evaluate our ability to seek and receive such accelerated approval. As a condition of approval, the FDA requires that a sponsor of a product receiving accelerated approval perform an adequate and well-controlled post-marketing confirmatory clinical trial or trials. These confirmatory trials must be completed with due diligence and we may be required to evaluate different or additional endpoints in these post-marketing confirmatory trials. These confirmatory trials may require enrollment of more patients than we currently anticipate and will result in additional costs, which may be greater than the estimated costs we currently anticipate. In addition, the FDA currently requires as a condition for accelerated approval preapproval of promotional materials, which could adversely impact the timing of the commercial launch of the product.

There can be no assurance that the FDA will agree with any proposed surrogate endpoints or that we will decide to pursue or submit a BLA for accelerated approval or any other form of expedited development, review or approval for any of our current or future product candidates. Similarly, there can be no assurance that, after feedback from FDA, we will continue to pursue or apply for accelerated approval or any other form of expedited development, review or approval, even if we initially decide to do so. Furthermore, if we decide to submit an application for accelerated approval or under another expedited regulatory designation, there can be no assurance that such submission or application will be accepted or that any expedited review or approval will be granted on a timely basis, or at all.

The FDA may withdraw approval of a product candidate approved under the accelerated approval pathway if, for example, the trial required to verify the predicted clinical benefit of our product candidate fails to verify such benefit or does not demonstrate sufficient clinical benefit to justify the risks associated with the drug. The FDA may also withdraw approval if other evidence demonstrates that our product candidate is not shown to be safe or effective under the conditions of use, we fail to conduct any required post approval trial of our product candidate with due diligence or we disseminate false or misleading promotional materials relating to our product candidate. A failure to obtain accelerated approval or any other form of expedited development, review or approval for our product candidates, or withdrawal of a product candidate, would result in a longer time period for commercialization of such product candidate, could increase the cost of development of such product candidate and could harm our competitive position in the marketplace.

With passage of the Food and Drug Omnibus Reform Act, or FDORA, in December 2022, Congress modified certain provisions governing accelerated approval of drug and biologic products. Specifically, the new legislation authorized the FDA to: require a sponsor to have its confirmatory clinical trial underway before accelerated approval is awarded, require a sponsor of a product granted accelerated approval to submit progress reports on its post-approval studies to the FDA every six months until the study is completed; and use expedited procedures to withdraw accelerated approval of a new drug application or BLA after the confirmatory trial fails to verify the product's clinical benefit. Further, FDORA requires the agency to publish on its website "the rationale for why a post-approval study is not appropriate or necessary" whenever it decides not to require such a study upon granting accelerated approval.

More recently, in March 2023, the FDA issued draft guidance that outlines its current thinking and approach to accelerated approval. The FDA indicated that the accelerated approval pathway is commonly used for approval of oncology drugs due to the serious and life-threatening nature of cancer. Although single-arm trials have been commonly used to support accelerated approval, a randomized controlled trial is the preferred approach as it provides a more robust efficacy and safety assessment and allows for direct comparisons to an available therapy. To that end, the FDA outlined considerations for designing, conducting, and analyzing data for trials intended to support accelerated approvals of oncology therapeutics. While this guidance is currently only in draft form and will not be legally binding even when finalized, we will need to consider the FDA's guidance closely if we seek accelerated approval for any of our products. Accordingly, even if we do receive accelerated approval, we may not experience a faster development or regulatory review or approval process, and receiving accelerated approval does not provide assurance of ultimate full FDA approval.

In the EU, a "conditional" marketing authorization may be granted in cases where all the required safety and efficacy data are not yet available. A conditional marketing authorization is subject to conditions to be fulfilled for generating missing data or ensuring increased safety measures. A conditional marketing authorization is valid for one year and has to be renewed annually until fulfillment of all relevant conditions. Once the applicable pending studies are provided, a conditional marketing authorization can become a "standard" marketing authorization. However, if the conditions are not fulfilled within the timeframe set by the EMA, the marketing authorization will cease to be renewed.

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

If we are required by the FDA, EMA or a comparable regulatory authority to obtain clearance or approval of a companion diagnostic test in connection with approval of any of our product candidates, such companion diagnostic test would be used during our more advanced phase clinical trials as well as in connection with the commercialization of our product candidates. To be successful in developing and commercializing product candidates in combination with these companion diagnostics, we or our collaborators will need to address a number of scientific, technical, regulatory and logistical challenges. According to FDA guidance, if the FDA determines that a companion diagnostic device is essential to ensuring the safe and effective use of a novel therapeutic product or new 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. In certain circumstances (for example, when a

therapeutic product is intended to treat a serious or life-threatening condition for which no satisfactory available therapy exists or when the labelling of an approved product needs to be revised to address a serious safety issue), however, the FDA may approve a therapeutic product without the prior or contemporaneous marketing authorization of a companion diagnostic. In this case, approval of a companion diagnostic may be a post-marketing requirement or commitment.

Co-development of companion diagnostics and therapeutic products is critical to the advancement of precision medicine. Whether initiated at the outset of development or at a later point, co-development should generally be conducted in a way that will facilitate obtaining contemporaneous marketing authorizations for the therapeutic product and the associated companion diagnostic. If a companion diagnostic is required to identify patients who are most likely to benefit from receiving the product, to be at increased risk for serious adverse events as a result of treatment with a particular therapeutic product, or to monitor response to treatment with a particular therapeutic product for the purpose of adjusting treatment to achieve improved safety or effectiveness, then the FDA has required marketing approval of all companion diagnostic tests essential for the safe and effective use of a therapeutic product for cancer therapies. Various foreign regulatory authorities also regulate in vitro companion diagnostics as medical devices and, under those regulatory frameworks, will likely require the conduct of clinical trials to demonstrate the safety and effectiveness of any future diagnostics we may develop, which we expect will require separate regulatory clearance or approval prior to commercialization in those countries.

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 genomic alteration or mutation alteration that the companion diagnostic was developed to detect. If the FDA, EMA or a comparable regulatory authority requires clearance or approval of a companion diagnostic for any of our product candidates, whether before, concurrently with approval, or post-approval of the product candidate, we, and/or future collaborators, may encounter difficulties in developing and obtaining clearance or approval for these companion diagnostics. The process of obtaining or creating such diagnostic is time consuming and costly. The FDA previously has required in vitro companion diagnostics intended to select the patients who will respond to a product candidate to obtain pre-market approval, or PMA, simultaneously with approval of the therapeutic candidate. The PMA process, including the gathering of preclinical and clinical data and the submission and review by the FDA, can take several years or longer. It involves a rigorous pre-market review during which the sponsor must prepare and provide 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. After a device is placed on the market, it remains subject to significant regulatory requirements, including requirements governing development, testing, manufacturing, distribution, marketing, promotion, labeling, import, export, record-keeping, and adverse event reporting.

Any delay or failure by us or third-party collaborators to develop or obtain regulatory clearance or approval of a companion diagnostic could delay or prevent approval or continued marketing of our related product candidates. Further, in April 2020, the FDA issued new guidance on developing and labeling companion diagnostics for a specific group of oncology therapeutic products, including recommendations to support a broader labeling claim rather than individual therapeutic products. We will continue to evaluate the impact of this guidance on our companion diagnostic development and strategy. This guidance and future issuances from the FDA, EMA and other regulatory authorities may impact our development of a companion diagnostic for our product candidates and could result in delays in regulatory clearance or approval or a change in the determination for whether or not a companion diagnostic is still required for our product candidates. We may be required to conduct additional studies to support a broader claim or more narrowed claim for a subset population. Also, to the extent other approved diagnostics are able to broaden their labeling claims to include any of our future approved product candidates covered indications, we may no longer need to continue our companion diagnostic development plans or we may need to alter those companion diagnostic development strategies, which could adversely impact our ability to generate revenue from the sale of our companion diagnostic test.

Additionally, we may rely on third parties for the design, development and manufacture of companion diagnostic tests for our product candidates. If we enter into such collaborative agreements, we will be dependent on the sustained cooperation and effort of our future collaborators in developing and obtaining clearance or approval for these companion diagnostics. It may be necessary to resolve issues such as selectivity/specificity, analytical validation, reproducibility, or clinical validation of companion diagnostics during the development and regulatory clearance or approval processes. Moreover, even if data from preclinical studies and early clinical trials appear to support development of a companion diagnostic for a product candidate, data generated in later clinical trials may fail to support the analytical and clinical validation of the companion diagnostic. We and our future collaborators may encounter difficulties in developing, obtaining regulatory clearance or approval for, manufacturing and commercializing companion diagnostics similar to those we face with respect to our product candidates themselves, including issues with achieving regulatory clearance or approval, production of sufficient quantities at commercial scale and with appropriate quality standards, and in gaining market acceptance.

If we are unable to successfully develop companion diagnostics for our product candidates, or experience delays in doing so, the development of our product candidates may be adversely affected, our product candidates may not obtain marketing approval, and we may not realize the full commercial potential of any of our product candidates that obtain marketing approval. As a result, our business, results of operations and financial condition could be materially harmed. In addition, a diagnostic company with whom we contract may decide to discontinue selling or manufacturing the companion diagnostic test that we anticipate using in connection with development and commercialization of product candidates or our relationship with such diagnostic company may otherwise terminate. We may not be able to enter into arrangements with another diagnostic company to obtain supplies of an alternative diagnostic test for use in connection with the development and commercialization of our product candidates or do so on commercially reasonable terms, which could adversely affect and/or delay the co-development or commercialization of our companion diagnostic and therapeutic product candidates.

If approved, our product candidates that are licensed and regulated as biologics may face competition from biosimilars approved through an abbreviated regulatory pathway.

The BPCIA was enacted as part of the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Affordability Reconciliation Act, or collectively, the ACA, to establish an abbreviated pathway for the approval of biosimilar and interchangeable biological products. The regulatory pathway establishes legal authority for the FDA to review and approve biosimilar biologics, including the possible designation of a biosimilar as "interchangeable" based on its similarity to an approved biologic.

Under the BPCIA, a reference biological product is granted 12 years of data exclusivity from the time of first licensure of the product, and the FDA will not accept an application for a biosimilar or interchangeable product based on the reference biological product until four years after the date of first licensure of the reference product In addition, the licensure 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 develop and receive licensure of a competing biologic, so long as its BLA does not reply on the reference product, sponsor's data or submit the application as a biosimilar application.

We believe that any of the product candidates we develop 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 biosimilar competition sooner than anticipated. Moreover, the extent to which a biosimilar, once approved, will be substituted for any one of the reference products in a way that is similar to traditional generic substitution for non-biological products will depend on a number of marketplace and regulatory factors that are still developing. Nonetheless, the approval of a biosimilar to our product candidates would have a material adverse impact on our business due to increased competition and pricing pressure.

Our activities, including our interactions with healthcare providers, third party payors, patients and government officials, are, and will continue to be, subject to extensive regulation involving health care, anti-corruption, data privacy and security and consumer protection laws. Failure to comply with applicable laws could result in substantial penalties, contractual damages, reputational harm, diminished revenues and curtailment or restructuring of our operations.

Our activities may now or in the future be directly or indirectly subject to various federal and state laws related to health care, anti-corruption, data privacy and security consumer protection. If we obtain FDA approval for any of our product candidates and begin commercializing those products in the United States, our potential exposure under such laws will increase significantly, and our costs associated with compliance with such laws are also likely to increase. These laws include, but are not limited to:

- federal false claims, false statements and civil monetary penalties laws prohibiting, among other things, any person from knowingly presenting, or causing to be presented, a false claim for payment of government funds or knowingly making, or causing to be made, a false statement to get a false claim paid;

- the federal anti-kickback law, which prohibits, among other things, persons from offering, soliciting, receiving or providing any remuneration, directly or indirectly, to induce, either the referral of an individual for, or the purchasing or ordering of a good or service, for which payment may be made under federal health care programs such as the Medicare and Medicaid;

- the federal anti-kickback prohibition known as Eliminating Kickbacks in Recovery Act, enacted in 2018, which prohibits certain payments related to referrals of patients to certain providers (recovery homes, clinical treatment facilities and laboratories) and applies to services reimbursed by private health plans as well as government health care programs;

- the federal law known as Health Insurance Portability and Accountability Act of 1996, or HIPAA, which, in addition to privacy protections to healthcare providers and other entities, prohibits executing a scheme to defraud any healthcare benefit program (which may include private health plans) or making false statements relating to healthcare matters;

- the Food, Drug, and Cosmetic Act, which among other things, strictly regulates drug marketing, prohibits manufacturers from marketing such products for off-label use and regulates the distribution of samples;

- federal laws that require pharmaceutical manufacturers to report certain calculated product prices to the government or provide certain discounts or rebates to government authorities or private entities, often as a condition of reimbursement under government healthcare programs;

- the so-called "federal sunshine" law, which requires pharmaceutical and medical device companies to monitor and report certain financial interactions with teaching hospitals, physicians and certain non-physician practitioners to the federal government for re-disclosure to the public;

- the privacy, security and breach provisions of HIPAA, which impose obligations on certain "covered entities" (healthcare providers, health plans and healthcare clearinghouses) and certain of their "business associate" contractors with respect to safeguarding the privacy, security and transmission of individually identifiable health information;

- federal and state laws and regulations, including state security breach notification laws, state health information privacy laws, and federal and state consumer protection laws, govern the collection, use, disclosure and protection of health-related and other personal information.

- federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers;

- the Foreign Corrupt Practices Act, or FCPA, a United States law which regulates certain financial relationships with foreign government officials (which could include, for example, certain medical professionals); and

- state law analogues of each of the above federal laws, such as anti-kickback and false claims laws which may apply to items or services reimbursed by any third-party payor, including private health plans, state privacy laws, state consumer protection laws, and state laws regulating interactions between pharmaceutical manufacturers and healthcare providers, requiring disclosure of such financial interactions or mandating adoption of certain compliance standards, many of which differ from each other in significant ways and often are not preempted by federal laws, thus complicating compliance efforts.

In addition, the regulatory approval and commercialization of any of our product candidates outside the United States will also likely subject us to foreign equivalents of the health care laws mentioned above, among other foreign laws. Efforts to ensure that our business arrangements will comply with applicable health care laws may involve substantial costs. It is possible that governmental and enforcement authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law interpreting applicable fraud and abuse or other health care laws and regulations. If our operations are found to be in violation of any of the laws described above or any other governmental regulations that apply to us, we may be subject to penalties, including, without limitation, civil, criminal and administrative penalties, damages, monetary fines, disgorgement, possible exclusion from participation in Medicare, Medicaid and other federal health care programs, contractual damages, reputational harm, diminished profits and future earnings and curtailment or restructuring of our operations.

Current and future legislation may increase the difficulty and cost for us to obtain reimbursement for our product candidates.

In the United States and some foreign jurisdictions, there have been and continue to be a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could, among other things, prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any products for which we obtain marketing approval. We expect that current laws, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and in additional downward pressure on the price that we may receive for any approved products. If reimbursement of our products is unavailable or limited in scope, our business could be materially harmed.

In March 2010, President Obama signed into law the Patient Protection and Affordable Care Act, or the PPACA, as amended by the Health Care and Education Affordability Reconciliation Act, collectively the ACA. In addition, other legislative changes have been proposed and adopted since the ACA was enacted. In August 2011, the Budget Control Act of 2011, among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least $1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. These changes included aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, which went into effect in April 2013 and will remain in effect through 2031 under the Coronavirus Aid, Relief, and Economic Security Act, or the CARES Act.

Under current legislation, the actual reductions in Medicare payments may vary up to 4%. The Consolidated Appropriations Act, which was signed into law by President Biden in December 2022, made several changes to sequestration of the Medicare program. Section 1001 of the Consolidated Appropriations Act delays the 4% Statutory Pay-As-You-Go Act of 2010, or PAYGO, sequester for two years, through the end of calendar year 2024. Triggered by enactment of the American Rescue Plan Act of 2021, the 4% cut to the Medicare program would have taken effect in January 2023. The Consolidated Appropriation Act's health care offset title includes Section 4163, which extends the 2% Budget Control Act of 2011 Medicare sequester for six months into fiscal year 2032 and lowers the payment reduction percentages in fiscal years 2030 and 2031.

The American Taxpayer Relief Act of 2012, among other things, reduced Medicare payments to several providers and increased the statute of limitations period for the government to recover overpayments to providers from three to five years. These laws may result in additional reductions in Medicare and other healthcare funding and otherwise affect the prices we may obtain for any of our products or product candidates for which we may obtain regulatory approval or the frequency with which any such product is prescribed or used.

Since enactment of the ACA, there have been and continue to be, numerous legal challenges and Congressional actions to repeal and replace provisions of the law. For example, with enactment of the Tax Cuts for Jobs Act, or the Tax Act, in 2017, Congress repealed the "individual mandate." The repeal of this provision, which requires most Americans to carry a minimal level of health insurance, became effective in 2019. On June 17, 2021, the U.S. Supreme Court dismissed the most recent challenge to the PPACA brought by several states without specifically ruling on the constitutionality of the PPACA. Litigation and legislation over the ACA are likely to continue, with unpredictable and uncertain results.

The Trump Administration also took executive actions to undermine or delay implementation of the ACA, including directing federal agencies with authorities and responsibilities under the ACA to waive, defer, grant exemptions from or delay the implementation of any provision of the ACA that would impose a fiscal or regulatory burden on states, individuals, healthcare providers, health insurers or manufacturers of pharmaceuticals or medical devices. On January 28, 2021, however, President Biden revoked those orders and issued a new Executive Order which directs federal agencies to reconsider rules and other policies that limit Americans' access to health care and consider actions that will protect and strengthen that access. Under this order, federal agencies are directed to re-examine: policies that undermine protections for people with pre-existing conditions, including complications related to COVID-19; demonstrations and waivers under Medicaid and the ACA that may reduce coverage or undermine the programs, including work requirements; policies that undermine the Health Insurance Marketplace or other markets for health insurance; policies that make it more difficult to enroll in Medicaid and the ACA; and policies that reduce affordability of coverage or financial assistance, including for dependents.

In the European Union, on December 13, 2021, Regulation No 2021/2282 on Health Technology Assessment, or HTA, amending Directive 2011/24/EU, was adopted. While the Regulation entered into force in January 2022, it will only begin to apply from January 2025 onwards, with preparatory and implementation-related steps to take place in the interim. Once applicable, it will have a phased implementation depending on the concerned products. The Regulation intends to boost cooperation among EU Member States in assessing health technologies, including new medicinal products as well as certain high-risk medical devices, and provide the basis for cooperation at the European Union level for joint clinical assessments in these areas. It will permit EU Member States to use common HTA tools, methodologies, and procedures across the European Union, working together in four main areas, including joint clinical assessment of the innovative health technologies with the highest potential impact for patients, joint scientific consultations whereby developers can seek advice from HTA authorities, identification of emerging health technologies to identify promising technologies early, and continuing voluntary cooperation in other areas. Individual EU Member States will continue to be responsible for assessing non-clinical (e.g., economic, social, ethical) aspects of health technology, and making decisions on pricing and reimbursement.

We expect that these healthcare reforms, as well as 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 and/or the level of reimbursement physicians receive for administering any approved product we might bring to market. Reductions in reimbursement levels may negatively impact the prices we receive or the frequency with which our products are prescribed or administered. Any reduction in reimbursement from Medicare or other government programs may result in a similar reduction in payments from private payors. Accordingly, such reforms, if enacted, could have an adverse effect on anticipated revenue from product candidates that we may successfully develop and for which we may obtain marketing approval and may affect our overall financial condition and ability to develop or commercialize product candidates.

The prices of prescription pharmaceuticals in the United States and foreign jurisdictions are subject to considerable legislative and executive actions and could impact the prices we obtain for our products, if and when licensed.

The prices of prescription pharmaceuticals have also been the subject of considerable discussion in the United States. There have been several recent U.S. congressional inquiries, as well as proposed and enacted state and federal legislation designed to, among other things, bring more transparency to pharmaceutical pricing, review the relationship between pricing and manufacturer patient programs, and reduce the costs of pharmaceuticals under Medicare and Medicaid. In 2020, President Trump issued several executive orders intended to lower the costs of prescription products and certain provisions in these orders have been incorporated into regulations. These regulations include an interim final rule implementing a most favored nation model for prices that would tie Medicare Part B payments for certain physician-administered pharmaceuticals to the lowest price paid in other economically advanced countries, effective January 1, 2021. That rule, however, has been subject to a nationwide preliminary injunction and, on December 29, 2021, the Center for Medicare & Medicaid Services, or CMS, issued a final rule to rescind it. With issuance of this rule, CMS stated that it will explore all options to incorporate value into payments for Medicare Part B pharmaceuticals and improve beneficiaries' access to evidence-based care.

In addition, in October 2020, HHS and the FDA published a final rule allowing states and other entities to develop a Section 804 Importation Program, or SIP, to import certain prescription drugs from Canada into the United States. That regulation was challenged in a lawsuit by PhRMA, but the case was dismissed by a federal district court in February 2023 after the court found that PhRMA did not have standing to sue HHS. Several states have passed laws allowing for the importation of drugs from Canada. Certain of these states have submitted Section 804 Importation Program proposals and are awaiting FDA approval. On January 5, 2023, the FDA approved Florida's plan for Canadian drug importation. The rule also creates a new safe harbor for price reductions reflected at the point-of-sale, as well as a new safe harbor for certain fixed fee arrangements between pharmacy benefit managers and manufacturers, the implementation of which has been delayed until January 1, 2032 by the Inflation Reduction Act, or IRA.

On July 9, 2021, President Biden signed Executive Order 14063, which focuses on, among other things, the price of pharmaceuticals. The order directs the Department of Health and Human Services, or HHS, to create a plan within 45 days to combat "excessive pricing of prescription pharmaceuticals and enhance domestic pharmaceutical supply chains, to reduce the prices paid by the federal government for such pharmaceuticals, and to address the recurrent problem of price gouging." On September 9, 2021, HHS released its plan to reduce pharmaceutical prices. The key features of that plan are to: (a) make pharmaceutical prices more affordable and equitable for all consumers and throughout the health care system by supporting pharmaceutical price negotiations with manufacturers; (b) improve and promote competition throughout the prescription pharmaceutical industry by supporting market changes that strengthen supply chains, promote biosimilars and generic drugs, and increase transparency; and (c) foster scientific innovation to promote better healthcare and improve health by supporting public and private research and making sure that market incentives promote discovery of valuable and accessible new treatments.

More recently, on August 16, 2022, the IRA was signed into law by President Biden. The new legislation has implications for Medicare Part D, which is a program available to individuals who are entitled to Medicare Part A or enrolled in Medicare Part B to give them the option of paying a monthly premium for outpatient prescription drug coverage. Among other things, the IRA requires manufacturers of certain drugs to engage in price negotiations with Medicare (beginning in 2026), with prices that can be negotiated subject to a cap; 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 HHS to implement many of these provisions through guidance, as opposed to regulation, for the initial years.

Specifically, with respect to price negotiations, Congress authorized Medicare to negotiate lower prices for certain costly single-source drug and biologic products that do not have competing generics or biosimilars and are reimbursed under Medicare Part B and Part D. CMS may negotiate prices for ten high-cost drugs paid for by Medicare Part D starting in 2026, followed by 15 additional Medicare Part D drugs in 2027, 15 additional Medicare Part B or Part D drugs in 2028, and 20 additional Medicare Part B or Part D drugs per year in 2029 and beyond. This provision applies to drug products that have been approved for at least nine years and biologics that have been licensed for 13 years, but it does not apply to drugs and biologics that have been approved for a single rare disease or condition. Nonetheless, since CMS may establish a maximum price for these products in price negotiations, we would be fully at risk of government action if our products are the subject of Medicare price negotiations. Moreover, given the risk that could be the case, these provisions of the IRA may also further heighten the risk that we would not be able to achieve the expected return on any of our product candidates, if approved, or the full value of our patents protecting any such approved drug products if prices are set after any such approved products have been on the market for nine years.

Further, the legislation subjects drug manufacturers to civil monetary penalties and a potential excise tax for failing to comply with the legislation by offering a price that is not equal to or less than the negotiated "maximum fair price" under the law or for taking price increases that exceed inflation. The legislation also requires manufacturers to pay rebates for drugs in Medicare Part D whose price increases exceed inflation. The new law also caps Medicare out-of-pocket drug costs at an estimated $4,000 a year in 2024 and, thereafter beginning in 2025, at $2,000 a year. In addition, the IRA potentially raises legal risks with respect to individuals participating in a Medicare Part D prescription drug plan who may experience a gap in coverage if they required coverage above their initial annual coverage limit before they reached the higher threshold, or "catastrophic period" of the plan. Individuals requiring services exceeding the initial annual coverage limit and below the catastrophic period, must pay 100% of the cost of their prescriptions until they reach the catastrophic period. Among other things, the IRA contains many provisions aimed at reducing this financial burden on individuals by reducing the co-insurance and co-payment costs, expanding eligibility for lower income subsidy plans, and price caps on annual out-of-pocket expenses, each of which could have potential pricing and reporting implications. Accordingly, while it is currently unclear how the IRA will be effectuated, we cannot predict with certainty what impact any federal or state health reforms will have on us, but such changes could impose new or more stringent regulatory requirements on our activities or result in reduced reimbursement for our products, any of which could adversely affect our business, results of operations and financial condition.

On June 6, 2023, Merck & Co. filed a lawsuit against the HHS and CMS asserting that, among other things, the IRA's Drug Price Negotiation Program for Medicare constitutes an uncompensated taking in violation of the Fifth Amendment of the Constitution. Subsequently, a number of other parties, including the U.S. Chamber of Commerce, Bristol Myers Squibb Company, the PhRMA, Astellas, Novo Nordisk, Janssen Pharmaceuticals, Novartis, AstraZeneca and Boehringer Ingelheim, also filed lawsuits in various courts with similar constitutional claims against the HHS and CMS. We expect that litigation involving these and other provisions of the IRA will continue, with unpredictable and uncertain results. Accordingly, while it is currently unclear how the IRA will be effectuated, we cannot predict with certainty what impact any federal or state health reforms will have on us, but such changes could impose new or more stringent regulatory requirements on our activities or result in reduced reimbursement for our products, if approved, any of which could adversely affect our business, results of operations and financial condition.

At the state level, individual states are increasingly aggressive in passing legislation and implementing 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. In addition, regional healthcare organizations 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. These measures could reduce the ultimate demand for our products, once approved, or put pressure on our product pricing. 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 products and services, which could result in reduced demand for our product candidates or additional pricing pressures.

In the European Union, similar political, economic and regulatory developments may affect our ability to profitably commercialize our product candidates, if approved. In markets outside of the United States and the European Union, reimbursement and healthcare payment systems vary significantly by country and many countries have instituted price ceilings on specific products and therapies. In many countries, including those of the European Union, the pricing of prescription pharmaceuticals is subject to governmental control and access. In these countries, pricing negotiations with governmental authorities can take considerable time after the receipt of marketing approval for a product. To obtain reimbursement or pricing approval in some countries, we or our collaborators may be required to conduct a clinical trial that compares the cost-effectiveness of our product to other available therapies. If reimbursement of our products is unavailable or limited in scope or amount or if pricing is set at unsatisfactory levels, our business could be materially harmed.

We are subject to stringent privacy laws, information security laws, regulations, policies and contractual obligations related to data privacy and security, and a failure to comply with such requirements could subject us to significant fines and penalties, which may have a material adverse effect on our business, financial condition or results of operations.

We are subject to data privacy and protection laws and regulations that apply to the collection, transmission, storage and use of personally-identifying information, which among other things, impose certain requirements relating to the privacy, security and transmission of personal information, including comprehensive regulatory systems in the United States, European Union and United Kingdom. The legislative and regulatory landscape for privacy and data protection continues to evolve in jurisdictions worldwide, and there has been an increasing focus on privacy and data protection issues with the potential to affect our business. Failure to comply with any of these laws and regulations could result in enforcement action against us, including fines, imprisonment of company officials and public censure, claims for damages by affected individuals, damage to our reputation and loss of goodwill, any of which could have a material adverse effect on our business, financial condition, results of operations or prospects.

There are numerous U.S. federal and state laws and regulations related to the privacy and security of personal information. In particular, regulations promulgated pursuant to HIPAA establish privacy and security standards that limit the use and disclosure of individually identifiable health information, or protected health information, and require the implementation of administrative, physical and technological safeguards to protect the privacy of protected health information and ensure the confidentiality, integrity and availability of electronic protected health information. Determining whether protected health information has been handled in compliance with applicable privacy standards and our contractual obligations can be complex and may be subject to changing interpretation. These obligations may be applicable to some or all of our business activities now or in the future.

If we are unable to properly protect the privacy and security of protected health information, we could be found to have breached our contracts. Further, if we fail to comply with applicable privacy laws, including applicable HIPAA privacy and security standards, we could face civil and criminal penalties. HHS enforcement activity can result in financial liability and reputational harm, and responses to such enforcement activity can consume significant internal resources. In addition, state attorneys general are authorized to bring civil actions seeking either injunctions or damages in response to violations that threaten the privacy of state residents. We cannot be sure how these regulations will be interpreted, enforced or applied to our operations. In addition to the risks associated with enforcement activities and potential contractual liabilities, our ongoing efforts to comply with evolving laws and regulations at the federal and state level may be costly and require ongoing modifications to our policies, procedures and systems.

In addition to potential enforcement by HHS, we are also potentially subject to privacy enforcement from the Federal Trade Commission, or the FTC. The FTC has been particularly focused on the unpermitted processing of health and genetic data through its recent enforcement actions and is expanding the types of privacy violations that it interprets to be "unfair" under Section 5 of the FTC Act, as well as the types of activities it views to trigger the Health Breach Notification Rule (which the FTC also has the authority to enforce). The agency is also in the process of developing rules related to commercial surveillance and data security that may impact our business. We will need to account for the FTC's evolving rules and guidance for proper privacy and data security practices in order to mitigate our risk for a potential enforcement action, which may be costly. If we are subject to a potential FTC enforcement action, we may be subject to a settlement order that requires us to adhere to very specific privacy and (depending on the nature of the alleged violations). If we violate any consent order that we reach with the FTC, we may be subject to additional fines and compliance requirements.

States are also active in creating specific rules relating to the processing of personal information. In 2018, California passed into law the California Consumer Privacy Act, or the CCPA, which took effect on January 1, 2020 and imposed many requirements

on businesses that process the personal information of California residents. Many of the CCPA's requirements are similar to those found in the General Data Protection Regulation, or the GDPR, which is further described below, including requiring businesses to provide notice to data subjects regarding the information collected about them and how such information is used and shared, and providing data subjects the right to request access to such personal information and, in certain cases, request the erasure of such personal information. The CCPA also affords California residents the right to opt-out of "sales" of their personal information. The CCPA contains significant penalties for companies that violate its requirements. In November 2020, California voters passed a ballot initiative for the California Privacy Rights Act, or the CPRA, which went into effect on January 1, 2023 and significantly expanded the CCPA to incorporate additional GDPR-like provisions including requiring that the use, retention and sharing of personal information of California residents be reasonably necessary and proportionate to the purposes of collection or processing, granting additional protections for sensitive personal information, and requiring greater disclosures related to notice to residents regarding retention of information. The CPRA also created a new enforcement agency – the California Privacy Protection Agency – the sole responsibility of which is to enforce the CPRA and other California privacy laws, which will further increase compliance risk. The provisions in the CPRA may apply to some of our business activities.

In addition to California, at least eleven other states have passed comprehensive privacy laws similar to the CCPA and CPRA. These laws are either in effect or will go into effect sometime before the end of 2026. Like the CCPA and CPRA, these laws create obligations related to the processing of personal information, as well as special obligations for the processing of "sensitive" data (which includes health data in some cases). Some of the provisions of these laws may apply to our business activities. There are also states that are strongly considering or have already passed comprehensive privacy laws during the 2023 legislative sessions that will go into effect in 2024 and beyond, including New Hampshire and New Jersey. Other states will be considering these laws in the future, and Congress has also been debating passing a federal privacy law. There are also states that are specifically regulating health information that may affect our business. For example, Washington state recently passed a health privacy law that will regulate the collection and sharing of health information, and the law also has a private right of action, which further increases the relevant compliance risk. Connecticut and Nevada have also passed similar laws regulating consumer health data. These laws may impact our business activities, including our identification of research subjects, relationships with business partners and ultimately the marketing and distribution of our products.

Similar to the laws in the United States, there are significant privacy and data security laws that apply in Europe and other countries. The collection, use, disclosure, transfer, or other processing of personal data, including personal health data, regarding individuals who are located in the European Economic Area, or the EEA, and the processing of personal data that takes place in the EEA, is regulated by the General Data Protection Regulation, or GDPR, which went into effect in May 2018 and which imposes obligations on companies that operate in our industry with respect to the processing of personal data and the cross-border transfer of such data. The GDPR imposes onerous accountability obligations requiring data controllers and processors to maintain a record of their data processing and policies. If our or our collaborators' or service providers' privacy or data security measures fail to comply with the GDPR requirements, we may be subject to litigation, regulatory investigations, enforcement notices requiring us to change the way we use personal data and/or fines of up to 20 million Euros or up to 4% of the total worldwide annual turnover of the preceding financial year, whichever is higher, as well as compensation claims by affected individuals, negative publicity, reputational harm and a potential loss of business and goodwill.

The GDPR places restrictions on the cross-border transfer of personal data from the European Union to countries that have not been found by the European Commission to offer adequate data protection legislation, such as the United States. There are ongoing concerns about the ability of companies to transfer personal data from the European Union to other countries. In July 2020, the Court of Justice of the European Union, or the CJEU, invalidated the EU-U.S. Privacy Shield, one of the mechanisms used to legitimize the transfer of personal data from the EEA to the United States. The CJEU decision also drew into question the long-term viability of an alternative means of data transfer, the standard contractual clauses, for transfers of personal data from the EEA to the United States. While we were not self-certified under the Privacy Shield, this CJEU decision may lead to increased scrutiny on data transfers from the EEA to the United States generally and increase our costs of compliance with data privacy legislation as well as our costs of negotiating appropriate privacy and security agreements with our vendors and collaborators.

In October 2022, President Biden signed an executive order to implement the EU-U.S. Data Privacy Framework, which serves as a replacement to the EU-U.S. Privacy Shield. The European Commission adopted the adequacy decision on July 10, 2023. The adequacy decision permits U.S. companies who self-certify to the EU-U.S. Data Privacy Framework to rely on it as a valid data transfer mechanism for data transfers from the European Union to the United States. However, some privacy advocacy groups have already suggested that they will be challenging the EU-U.S. Data Privacy Framework. If these challenges are successful, they may not only impact the EU-U.S. Data Privacy Framework, but also further limit the viability of the standard contractual clauses and other data transfer mechanisms. The uncertainty around this issue has the potential to impact our business.

Following the withdrawal of the United Kingdom from the European Union, the U.K. Data Protection Act 2018 applies to the processing of personal data that takes place in the United Kingdom and includes parallel obligations to those set forth by GDPR. The Data Protection Act of 2018 in the United Kingdom that "implements" and complements the GDPR achieved Royal Assent on May 23, 2018 and is effective in the United Kingdom. Transfers of personal data from the EEA to the United Kingdom are currently lawful under the GDPR because of a June 2021 adequacy decision from the European Commission. However, this decision may be challenged in court. The United Kingdom has determined that it considers all of the EU 27 and EEA member states to be adequate for the purposes of data protection, ensuring that data flows from the United Kingdom to the EU/EEA remain unaffected.

Beyond GDPR, there are privacy and data security laws in a growing number of countries around the world. While many loosely follow GDPR as a model, other laws contain different or conflicting provisions. These laws will impact our ability to conduct our business activities, including both our clinical trials and the sale and distribution of commercial products, if approved, through increased compliance costs, costs associated with contracting and potential enforcement actions.

While we continue to address the implications of the recent changes to data privacy regulations, data privacy remains an evolving landscape at both the domestic and international level, with new regulations coming into effect and continued legal challenges, and our efforts to comply with the evolving data protection rules may be unsuccessful. It is possible that these laws may be interpreted and applied in a manner that is inconsistent with our practices, which could adversely affect our business. We must devote significant resources to understanding and complying with this changing landscape. Failure to comply with federal, state and international laws regarding privacy and security of personal information could expose us to fines and penalties under such laws.

Laws and regulations governing any international operations we may have in the future may preclude us from developing, manufacturing and selling certain products outside of the United States and require us to develop and implement costly compliance programs.

If we expand our operations outside the United States, we will need to dedicate additional resources to comply with U.S. laws regarding international operations and the laws and regulations in each jurisdiction in which we operate and plan to operate. The FCPA prohibits any U.S. individual or business from paying, offering or authorizing payment or offering of anything of value, directly or indirectly, to any foreign official, political party or candidate for the purpose of influencing any act or decision of the foreign entity in order to assist the individual or business in obtaining or retaining business. The FCPA also obligates companies whose securities are listed in the United States to comply with certain accounting provisions requiring the company to maintain books and records that accurately and fairly reflect all transactions of the company, including international subsidiaries and to devise and maintain an adequate system of internal accounting controls for international operations.

Compliance with the FCPA is expensive and difficult, particularly in countries in which corruption is a recognized problem. In addition, the FCPA presents particular challenges in the pharmaceutical industry because in many countries, hospitals are operated by the government and doctors and other hospital employees are considered foreign officials. Certain payments to hospitals in connection with clinical trials and other work have been deemed to be improper payments to government officials and have led to FCPA enforcement actions.

Various laws, regulations and executive orders also restrict the use and dissemination outside of the United States or the sharing with certain non-U.S. nationals, of information classified for national security purposes, as well as certain products and technical data relating to those products. Further, the provision of benefits or advantages to physicians to induce or encourage the prescription, recommendation, endorsement, purchase, supply, order or use of medicinal products is prohibited in the European Union. The provision of benefits or advantages to physicians is also governed by the national anti-bribery laws of E.U. Member States, such as the U.K. Bribery Act 2010. Infringement of these laws could result in substantial fines and imprisonment. Payments made to physicians in certain E.U. Member States must be publicly disclosed. Moreover, agreements with physicians often must be the subject of prior notification and approval by the physician's employer, his or her competent professional organization and/or the regulatory authorities of the individual E.U. Member States. These requirements are provided in the national laws, industry codes or professional codes of conduct applicable in the E.U. Member States. Failure to comply with these requirements could result in reputational risk, public reprimands, administrative penalties, fines or imprisonment.

If we expand our presence outside of the United States, it will require us to dedicate additional resources to comply with these laws and these laws may preclude us from developing, manufacturing or selling certain products and product candidates outside of the United States, which could limit our growth potential and increase our development costs. The failure to comply with

laws governing international business practices may result in substantial civil and criminal penalties and suspension or debarment from government contracting. The SEC also may suspend or bar issuers from trading securities on U.S. exchanges for violations of the FCPA's accounting provisions.

We and our third-party contract manufacturers must comply with environmental, health and safety laws and regulations, and failure to comply with these laws and regulations could expose us to significant costs or liabilities.

We and our third-party manufacturers are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the use, generation, manufacture, distribution, storage, handling, treatment, remediation and disposal of hazardous materials and wastes. Hazardous chemicals, including flammable and biological materials, are involved in certain aspects of our business, and we cannot eliminate the risk of injury or contamination from the use, generation, manufacture, distribution, storage, handling, treatment or disposal of hazardous materials and wastes. In the event of contamination or injury, or failure to comply with environmental, health and safety laws and regulations, we could be held liable for any resulting damages and any such liability could exceed our assets and resources. We could also incur significant costs associated with civil or criminal fines and penalties for failure to comply with such laws and regulations. Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials, this insurance may not provide adequate coverage against potential liabilities. We do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us in connection with our storage or disposal of biological, hazardous or radioactive materials.

Environmental, health and safety laws and regulations are becoming increasingly more stringent. We may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may impair our research, development or production efforts. Our failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions.

Further, with respect to the operations of our third-party contract manufacturers, it is possible that if they fail to operate in compliance with applicable environmental, health and safety laws and regulations or properly dispose of wastes associated with our products, we could be held liable for any resulting damages, suffer reputational harm or experience a disruption in the manufacture and supply of our product candidates or products.

Our employees may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements and insider trading.

We are exposed to the risk of employee fraud or other misconduct. Misconduct by employees could include intentional failures to comply with FDA regulations, to provide accurate information to the FDA, to comply with manufacturing standards we have established, to comply with federal and state healthcare fraud and abuse laws and regulations, to comply with state and federal securities laws, to report financial information or data accurately or to disclose unauthorized activities to us. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Employee misconduct could also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and serious harm to our reputation. It is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent this activity may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. Additionally, we are subject to the risk that a person could allege such fraud or other misconduct, even if none occurred. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of civil, criminal and administrative penalties, damages, monetary fines, disgorgement, possible exclusion from participation in Medicare, Medicaid and other federal health care programs, contractual damages, reputational harm, diminished profits and future earnings and curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our results of operations.

Changes in U.S. and international trade policies, particularly with respect to China, may adversely impact our business and operating results.

The U.S. government has recently made statements and taken certain actions that may lead to potential changes to U.S. and international trade policies, including imposing several rounds of tariffs and export control restrictions affecting certain products manufactured in China. In March 2018, the Trump administration announced the imposition of tariffs on steel and aluminum entering the United States and in June 2018, the Trump administration announced further tariffs targeting goods

imported from China. Recently both China and the United States have each imposed tariffs indicating the potential for further trade barriers, including the U.S. Commerce Department adding numerous Chinese entities to its "unverified list," which requires U.S. exporters to go through more procedures before exporting goods to such entities. It is unknown whether and to what extent new tariffs, export controls, or other new laws or regulations will be adopted, or the effect that any such actions would have on us or our industry, and it is unclear whether the Biden administration will work to reverse these measures or pursue similar policy initiatives. Most recently, in February 2024, U.S. lawmakers have called for investigations into and the imposition of possible economic sanctions against Chinese biotechnology companies WuXi AppTec and WuXi Biologics, or collectively WuXi, over alleged ties to the Chinese military. Any unfavorable government policies on international trade, such as export controls, capital controls or tariffs, may increase the cost of manufacturing our product candidates and platform materials, affect the demand for our drug products (if and once approved), the competitive position of our product candidates, and import or export of raw materials and finished product candidate used in our and our collaborators' preclinical studies and clinical trials, particularly with respect to any product candidates and materials that we import from China, including pursuant to our manufacturing service arrangements with WuXi. If any new tariffs, export controls, legislation and/or regulations are implemented, or if existing trade agreements are renegotiated or, in particular, if either the U.S. or Chinese government takes retaliatory trade actions due to the recent trade tension, such changes could have an adverse effect on our business, financial condition and results of operations.

Risks Related to our Business and Industry

If we fail to attract and retain senior management and key scientific personnel, we may be unable to successfully develop our ADC product candidates, conduct our clinical trials and commercialize our ADC product candidates.

Our ability to compete in the highly competitive biotechnology and biopharmaceutical industries depends upon our ability to attract, motivate and retain highly qualified managerial, scientific and medical personnel. We are highly dependent on members of our senior management, including Martin Huber, M.D., our President and Chief Executive Officer, who succeeded Anna Protopapas in that role in September 2023. We also announced the departures of our Chief Medical Officer and Chief People Officer in September 2023.The loss of the services of any additional members of our senior management could impede the achievement of our research, development and commercialization objectives. Also, each of these persons may terminate their employment with us at any time. We do not maintain "key person" insurance for any of our executives or other employees.

Recruiting and retaining qualified scientific, clinical, sales and marketing personnel will also be critical to our success. We conduct our operations at our facility in Cambridge, Massachusetts, in a region that is headquarters to many other biopharmaceutical companies and many academic and research institutions. Competition for skilled personnel is intense and the turnover rate can be high, which may limit our ability to hire and retain highly qualified personnel on acceptable terms or at all. We may not be able to attract and retain these personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. Further, in July 2023, following our announcement that our UPLIFT clinical trial had not yet met its primary endpoint, we announced a reduction-in-force of approximately 50% of our then-current employee base, or the Restructuring, which Restructuring was substantially completed as of December 31, 2023. The Restructuring may make future retention and recruiting of qualified personnel more difficult. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be employed or have commitments under consulting or advisory contracts with other entities that may limit their availability to us.

Our business and operations would suffer in the event of system failures, security breaches or cyberattacks.

Our computer systems, as well as those of various third parties with whom we collaborate or on which we rely, or may rely in the future, including our CROs and other contractors, consultants, and law and accounting firms, are vulnerable to service interruptions or security breaches, including from cyberattacks, computer viruses, ransomware, malware, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. We rely on our third-party providers to implement effective security measures and identify and correct for any such failures, deficiencies or breaches. The risk of a security breach or disruption, particularly through cyberattacks or cyber intrusion, including by computer hackers, foreign governments, nation-state actors and cyber terrorists, has generally increased as the number, intensity and sophistication of attempted attacks and intrusions from around the world have increased. In particular, severe ransomware attacks are becoming increasingly prevalent and can lead to significant interruptions in our operations, ability to provide our products or services, loss of sensitive data and income, reputational harm and diversion of funds. Extortion payments may shorten the duration of the negative impacts of a ransomware attack, but we may be unwilling or unable to make such payments due to, for example, applicable laws or regulations prohibiting such payments. However, if any failure, accident or security breach were to occur and

cause interruptions in our operations or the operations of those third parties with which we contract, it could result in a material disruption of our programs and our business operations.

Most of our employees work in a hybrid fashion, and we also have employees who work remotely. Such arrangements have increased risks to our information technology systems and data, as more of our employees utilize network connections, computers and devices outside our premises or network, including working at home, while in transit and in public locations.

We have experienced attempted but unsuccessful phishing attacks in the past, which have not had a material impact on our operations; however, we may in the future experience material system failures or security breaches that could cause interruptions in our operations or result in a material disruption of our development programs. We could lose access to our trade secrets or other proprietary information or experience other disruptions, which could require a substantial expenditure of resources to remedy. For example, the loss of clinical trial data for our product candidates could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data.

We could also be subject to risks caused by misappropriation, misuse, leakage, falsification or intentional or accidental release or loss of information maintained in our information systems and networks, including personal information of our employees or others. Outside parties may attempt to penetrate our systems or those of the third parties with which we contract or to coerce or fraudulently induce our employees or employees of such third parties to disclose sensitive information to gain access to our data. The number and complexity of these threats continue to increase over time. Although we develop and maintain systems and controls designed to prevent these events from occurring, and we have a process to identify and mitigate threats, such risks cannot be eliminated. Furthermore, there can be no assurance that we, or those third parties with which we contract, will promptly detect any such disruption or security breach, if at all. Additionally, the development and maintenance of these systems, controls and processes is costly and requires ongoing monitoring and updating as technologies change and efforts to overcome security measures become more sophisticated. To the extent that any disruption or security breach results in a loss of or damage to our data or applications or other data or applications relating to our technology or product candidates, or inappropriate disclosure of confidential or proprietary information, we could incur liabilities, our competitive position and the market perception of the effectiveness of our security measures could be harmed, our credibility could be damaged and the further development of our product candidates could be delayed.

Increasing use of social media and artificial intelligence-based platforms could give rise to liability, breaches of data security and privacy laws, or reputational damage.

We and our employees are increasingly utilizing social media tools as a means of communication both internally and externally. Despite our efforts to monitor evolving social media communication guidelines and comply with applicable rules, there is a risk that the use of social media by us or our employees to communicate about our products or business may cause us to be found in violation of applicable requirements. In addition, our employees may knowingly or inadvertently make use of social media in ways that may not comply with our social media policy or other legal or contractual requirements, which may give rise to liability, lead to the loss of trade secrets or other intellectual property, or result in public exposure of personal data of our employees, clinical trial participants and others. Furthermore, negative posts or comments about us or our product candidates in social media could seriously damage our reputation, brand image and goodwill. Additionally, artificial intelligence, or AI, -based solutions, including generative AI, are increasingly being used in the biotechnology and biopharmaceutical industries, including by us. The use of AI solutions by our employees or third parties on which we rely may continue to increase and may lead to the public disclosure of confidential information (including personal data and proprietary information) in contravention of our internal policies, data protection laws, other applicable law or contractual requirements. The misuse of AI solutions may give rise to liability, lead to the loss of trade secrets or other intellectual property, result in reputational harm, or lead to outcomes with unintended biases or other consequences. The misuse of AI solutions could also result in unauthorized access and use of personal data of our employees, clinical trial participants, collaborators or other third parties. Any of these events could have a material adverse effect on our business, prospects, operating results, and financial condition and could adversely affect the price of our common stock.

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

Although we implemented the Restructuring in 2023 following our discontinuance of development of UpRi, as we seek to advance our current product candidates through clinical trials and commercialization, we will need to expand our development, regulatory, manufacturing, marketing and sales capabilities or contract with third parties to provide these capabilities for us. As our operations have expanded in the past, we have needed to, and if our operations expand again in the future, we expect that we will continue to need to manage additional relationships with various strategic collaborators, suppliers and other third

parties. Future growth will impose significant added responsibilities on members of management. Our future financial performance and our ability to commercialize our product candidates and to compete effectively will depend, in part, on our ability to manage any future growth effectively. To that end, we must be able to manage our development efforts and clinical trials effectively and hire, train and integrate additional management, administrative and, if necessary, sales and marketing personnel. Due to our limited financial resources and the logistical and operational changes involved in managing such anticipated growth, we may not be able to accomplish these tasks, and our failure to accomplish any of them could prevent us from successfully growing our company or disrupt our operations.

If product liability lawsuits or other claims are brought against us, we may incur substantial liabilities and may be required to limit commercialization of our ADC product candidates.

We face an inherent risk of product liability as a result of the clinical testing of our product candidates and will face an even greater risk if we commercialize any products. For example, we may be sued or have other claims brought against us if any product we develop causes, or is perceived to cause, injury or is found to be otherwise unsuitable during clinical 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, negligence, strict liability and a breach of warranties. Claims could also be asserted under state or foreign consumer protection acts or similar schemes. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our product candidates. Even a successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- injury to our reputation;
- decreased demand for our product candidates or products that we may develop;
- withdrawal of clinical trial participants;
- costs to defend the related litigations;
- a diversion of management's time and our resources;
- substantial monetary awards to clinical trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- loss of revenue;
- the inability to commercialize our product candidates; and
- a decline in our stock price.

Failure 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 products we develop. We currently carry product liability insurance covering our clinical trials in the amount of $10 million in the aggregate. Although we 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 also have various exclusions, and we may be subject to a product liability claim for which we have no coverage. In such instance, we might 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. If we are unable to obtain or maintain sufficient insurance coverage at an acceptable cost or to otherwise protect against potential product liability claims, it could prevent or inhibit the development and commercial production and sale of our product candidates, which could adversely affect our business, financial condition, results of operations and prospects.

We may acquire assets or form strategic alliances in the future, and we may not realize the benefits of such acquisitions.

We may acquire additional technologies and assets, form strategic alliances or create joint ventures with third parties that we believe will complement or augment our existing business. If we acquire assets with promising markets or technologies, we may not be able to realize the benefit of acquiring such assets if we are unable to successfully integrate them with our existing technologies. We may encounter numerous difficulties in developing, manufacturing and marketing any new products resulting from a strategic alliance or acquisition that delay or prevent us from realizing their expected benefits or enhancing our business. We cannot be assured that, following any such acquisition, we will achieve the expected synergies to justify the transaction.

Risks Related to Our Common Stock

If our stock price is volatile, our stockholders could incur substantial losses.

Our stock price has been and may continue to be volatile. During the period from February 23, 2021 to February 23, 2024, the closing price of our common stock ranged from a high of $19.78 per share to a low of $1.06 per share. The market price of shares of our common stock could be subject to wide fluctuations in response to many risk factors listed in this "Risk Factors" section, and others beyond our control, including:

- results and timing of preclinical studies and clinical trials of our current or future product candidates, including XMT-1660 and XMT-2056;
- results of clinical trials of our competitors' products;
- failure to adequately protect our trade secrets;
- the terms on which we raise additional capital or our ability to raise it;
- commencement or termination of any strategic collaboration or licensing arrangement;
- regulatory developments, including actions with respect to our products or our competitors' products;
- actual or anticipated fluctuations in our financial condition and operating results;
- publication of research reports by securities analysts about us or our competitors or our industry;
- our failure or the failure of our competitors to meet analysts' projections or guidance that we or our competitors may give to the market;
- additions and departures of key personnel;
- strategic decisions by us or our competitors, such as acquisitions, divestitures, spin-offs, joint ventures, strategic investments or changes in business strategy;
- the passage of legislation or other regulatory developments affecting us or our industry;
- changes in the structure of healthcare payment systems;
- fluctuations in the valuation of companies perceived by investors to be comparable to us;
- sales of our common stock by us (including through our ATM offering program), our insiders or our other stockholders;
- speculation in the press or investment community;
- announcement or expectation of additional financing efforts;
- changes in market conditions for biopharmaceutical stocks; and
- changes in general market and economic conditions, such as geopolitical conflicts, including the ongoing conflict between Russia and Ukraine and the ongoing war between Israel and Hamas, sustained high interest rates and inflation.

In addition, the stock market has historically experienced significant volatility, particularly with respect to pharmaceutical, biotechnology and other life sciences company stocks. The volatility of pharmaceutical, biotechnology and other life sciences company stocks often does not relate to the operating performance of the companies represented by the stock. As a result of this volatility, stockholders may not be able to sell their common stock at or above the price for which they paid for their shares. As we operate in a single industry, we are especially vulnerable to these factors to the extent that they affect our industry or our products, or to a lesser extent our markets. Furthermore, as a result of this volatility, we may not be able to maintain compliance with listing requirements of the Nasdaq Stock Market. In the past, securities class action litigation has often been initiated against companies following periods of volatility in their stock price. This type of litigation could result in substantial costs and divert our management's attention and resources, and could also require us to make substantial payments to satisfy judgments or to settle litigation.

We do not expect to pay any cash dividends for the foreseeable future.

We do not anticipate that we will pay any cash dividends to holders of our common stock in the foreseeable future. Instead, we plan to retain any earnings to maintain and expand our operations. In addition, our New Credit Facility contains terms and any future debt financing arrangement may contain additional terms prohibiting or limiting the amount of dividends that may be declared or paid on our common stock. Accordingly, investors must rely on sales of their common stock after price appreciation, which may never occur, as the only way to realize any return on their investment.

Provisions in our amended and restated certificate of incorporation, as amended, our second amended and restated by-laws and Delaware law may have anti-takeover effects that could discourage an acquisition of us by others, even if an acquisition would be beneficial to our stockholders, and may prevent attempts by our stockholders to replace or remove our current management.

Our amended and restated certificate of incorporation, as amended, second amended and restated by-laws and Delaware law contain provisions that may have the effect of discouraging, delaying or preventing a change in control of us or changes in our management that stockholders may consider favorable, including transactions in which our stockholders might otherwise receive a premium for their shares. Our amended and restated certificate of incorporation, as amended, and second amended and restated by-laws include provisions that:

- authorize "blank check" preferred stock, which could be issued by our board of directors without stockholder approval and may contain voting, liquidation, dividend and other rights superior to our common stock;
- create a classified board of directors whose members serve staggered three-year terms;
- specify that special meetings of our stockholders can be called only by our board of directors;
- prohibit stockholder action by written consent;
- establish an advance notice procedure for stockholder approvals to be brought before an annual meeting of our stockholders, including proposed nominations of persons for election to our board of directors;
- provide that vacancies on our board of directors may be filled only by a majority of directors then in office, even though less than a quorum;
- provide that our directors may be removed only for cause;
- specify that no stockholder is permitted to cumulate votes at any election of directors;
- expressly authorize our board of directors to have discretion to modify, alter or repeal our second amended and restated by-laws; and
- require supermajority votes of the holders of our common stock to amend specified provisions of our amended and restated certificate of incorporation, as amended, and second amended and restated by-laws.

In addition, because we are incorporated in the State of Delaware, we are governed by the provisions of Section 203 of the General Corporation Law of the State of Delaware, or the DGCL, which prohibits a person who owns in excess of 15% of our outstanding voting stock from merging or combining with us for a period of three years after the date of the transaction in

which the person acquired in excess of 15% of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner.

Any provision of our amended and restated certificate of incorporation, as amended, second amended and restated by-laws or Delaware law that has the effect of delaying or deterring a change in control could limit the opportunity for our stockholders to receive a premium for their shares of our common stock, and could also affect the price that some investors are willing to pay for our common stock.

Our ability to use net operating losses and certain tax credit carryforwards may be subject to certain limitations.

For the years ended December 31, 2023, 2022 and 2021, we recorded no income tax benefit for the net operating losses, or NOLs, incurred in each year, due to the uncertainty of realizing a benefit from those items. We have incurred NOLs since our inception. As of December 31, 2023 , we have federal NOLs of approximately $479.0 million and state NOLs of approximately $414.8 million. Of the $479.0 million of federal NOLs, $34.1 million expire at various dates through 2037. The remaining $444.8 million of federal NOLs do not expire. The state NOLs will expire at various dates through 2043. As of December 31, 2022, we had federal and state research and development tax credit carryforwards of approximately $23.2 million and $6.8 million, respectively, which expire at various dates through 2043. Under the Tax Act, federal NOLs incurred in 2018 and in future years may be carried forward indefinitely, but the deductibility of such federal NOLs is limited. It is uncertain if and to what extent various states will conform to the Tax Act. In addition, under Section 382 of the Internal Revenue Code, or the Code, and corresponding provisions of state law, if a corporation undergoes an "ownership change," which is generally defined as a greater than 50% change, by value, in its equity ownership over a three-year period, the corporation's ability to use its pre-change NOLs and other pre-change tax attributes to offset its post-change income or taxes may be limited. We have determined that ownership changes have occurred since our inception and that certain NOLs and research and development tax credit carryforwards will be subject to limitation. Future changes in our stock ownership, some of which are outside of our control, could result in ownership changes under Section 382 of the Code further limiting our ability to utilize our NOLs and research and development tax credit carryforwards. Our NOLs may also be impaired under state law. Accordingly, we may not be able to utilize a material portion of our NOLs and research and development tax credit carryforwards. Furthermore, our ability to utilize our NOLs and research and development tax credit carryforwards is conditioned upon our attaining profitability and generating U.S. federal taxable income. We have incurred net losses since our inception and anticipate that we will continue to incur significant losses for at least the next several years; thus, we do not know when we will generate the U.S. federal taxable income necessary to utilize our NOLs. We have recorded a full valuation allowance related to our NOLs and other deferred tax assets due to the uncertainty of the ultimate realization of the future benefits of those assets.

Changes in tax laws or in their implementation or interpretation may adversely affect our business and financial condition.

Changes in tax law may adversely affect our business or financial condition. The Tax Act, as amended by the CARES Act, significantly revised the Code. The Tax Act, among other things, contains significant changes to corporate taxation, including the reduction of the corporate tax rate from a top marginal rate of 35% to a flat rate of 21% and the limitation of the deduction for NOLs to 80% of current year taxable income for losses arising in taxable years beginning after December 31, 2017, though any such NOLs may be carried forward indefinitely. In addition, beginning in 2022, the Tax Act eliminates the option to deduct research and development expenditures currently and requires corporations to capitalize and amortize them over five years or 15 years in the case of expenditures attributable to foreign research.

In addition to the CARES Act, as part of Congress' response to the COVID-19 pandemic, economic relief legislation was enacted in 2020 and 2021 containing tax provisions. The IRA, which was signed into law in August 2022, also introduced new tax provisions, including a one percent excise tax imposed on certain stock repurchases by publicly traded corporations. The one percent excise tax generally applies to any acquisition of stock by the publicly traded corporation (or certain of its affiliates) from a stockholder of the corporation in exchange for money or other property (other than stock of the corporation itself), subject to a de minimis exception. Thus, the excise tax could apply to certain transactions that are not traditional stock repurchases.

Regulatory guidance under the Tax Act, the IRA, and additional legislation is and continues to be forthcoming, and such guidance could ultimately increase or lessen their impact on our business and financial condition. In addition, it is uncertain if and to what extent various states will conform to the Tax Act, the IRA, and additional tax legislation.

Our amended and restated certificate of incorporation, as amended, designates the state or federal courts within the State of Delaware as the exclusive forum for certain types of actions and proceedings that may be initiated by our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated certificate of incorporation, as amended, provides that, subject to limited exceptions, the Court of Chancery of the State of Delaware will be the exclusive forum for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a claim of breach of a fiduciary duty owed by any of our directors, officers or other employees to us or our stockholders, (3) any action asserting a claim against us arising pursuant to any provision of the DGCL, our amended and restated certificate of incorporation, as amended, or our second amended and restated by-laws, (4) any action to interpret, apply, enforce or determine the validity of our amended and restated certificate of incorporation, as amended, or second amended and restated by-laws or (5) any other action asserting a claim against us that is governed by the internal affairs doctrine, in each case subject to the Court of Chancery having personal jurisdiction over the indispensable parties named as defendants therein. Any person or entity that purchases or otherwise acquires any interest in shares of our capital stock shall be deemed to have notice of and to have consented to the provisions of our amended and restated certificate of incorporation, as amended, described above. This choice of forum provision 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 employees. Alternatively, if a court were to find these provisions of our amended and restated certificate of incorporation inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could adversely affect our business and financial condition.

This exclusive forum provision would not apply to suits brought to enforce a duty or liability created by the Securities Exchange Act of 1934, as amended, which provides for exclusive jurisdiction of the federal courts. It could apply, however, to a suit that falls within one or more of the categories enumerated in the exclusive forum provision and asserts claims under the Securities Act of 1933, as amended, or the Securities Act, inasmuch as Section 22 of the Securities Act creates concurrent jurisdiction for federal and state courts over all suits brought to enforce any duty or liability created by the Securities Act or the rules and regulations thereunder, provided, that with respect to claims under the Securities Act, our stockholders will not be deemed to have waived our compliance with the federal securities laws and the rules and regulations thereunder.

If securities analysts do not publish research or reports about our business or if they publish negative evaluations of our stock, the price of our stock and trading volume could decline.

The trading market for our common stock depends, in part, on the research and reports that industry or financial analysts publish about us or our business. If one or more of the analysts covering our business downgrade their evaluations of our stock, the price of our stock could decline. If one or more of these analysts cease to cover our stock or fail to regularly publish reports on us, we could lose visibility in the market for our stock, which in turn could cause our stock price to decline.

A portion of our total outstanding shares may be sold into the market in the near future, which could cause the market price of our common stock to decline significantly, even if our business is doing well.

Sales of a significant number of shares of our common stock in the public market could occur at any time. These sales, or the perception in the market that the holders of a large number of shares of common stock intend to sell shares, could reduce the market price of our common stock.

We have registered substantially all shares of common stock that we may issue under our equity compensation plans. These shares can be freely sold in the public market upon issuance and once vested, subject to volume limitations applicable to affiliates. If any of these additional shares are sold, or if it is perceived that they will be sold, in the public market, the market price of our common stock could decline.

General Risk Factors

We are a "smaller reporting company" within the meaning of the Securities Act of 1933, as amended, and if we decide to take advantage of certain exemptions from various reporting requirements applicable to smaller reporting companies, our common stock could be less attractive to investors.

For so long as we qualify as a "smaller reporting company," we will have the option to take advantage of certain exemptions from various reporting and other requirements that are applicable to other public companies that are not "smaller reporting companies," including but not limited to reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements and later effective dates for compliance with certain new disclosure obligations. In addition, for as long as we are deemed neither a large accelerated filer nor accelerated filer, we will continue to use the exemption from compliance with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended, or the Sarbanes-Oxley Act. We will remain a smaller reporting company if we have either (i) a public float of less than $250 million held by non-affiliates as of the last business day of the second quarter of our then-current fiscal year or (ii) annual revenues of less than $100 million during such recently completed fiscal year with less than $700 million in public float as of the last business day of the second quarter of such fiscal year.

In the event we are eligible to and do rely on the exemptions available to smaller reporting companies, we cannot predict if investors will find our common stock less attractive because we may or do 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 more volatile.

Unfavorable global economic or geopolitical conditions could adversely affect our business, financial condition or results of operations.

Our results of operations could be adversely affected by general conditions in the global economy, geopolitical considerations and global financial market conditions, including changes in inflation, interest rates and overall economic conditions and uncertainties. For example, the global financial crisis caused extreme volatility and disruptions in the capital and credit markets. We cannot assure stockholders that deterioration of the global credit and financial markets would not negatively impact our stock price, our current portfolio of cash equivalents or investments, or our ability to meet our financing objectives. If the current equity and credit markets deteriorate, it may make any necessary debt or equity financing more difficult, more costly, 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. A weak or declining economy, could also strain our suppliers and vendors involved in our clinical development activities.

Additionally, the ongoing conflict between Russia and Ukraine that began in February 2022 and the global response, including the imposition of sanctions by the United States and other countries, as well as the war between Israel and Hamas, could create or exacerbate risks facing our business. We have evaluated our operations, vendor contracts and clinical trial arrangements, and at present we do not expect these conflicts to directly have a materially adverse effect on our financial condition or results of operations. However, if these hostilities persist, escalate or expand, other risks we have identified in this report may be exacerbated. For example, if our supply arrangements or clinical sites are disrupted due to expanded sanctions or involvement of countries where we have operations or relationships, our business could be materially disrupted. Further, the use of state-sponsored cyberattacks could expand as part of the conflicts, which could adversely affect our ability to maintain or enhance our cyber security and data protection measures. Any of the foregoing could harm our business, and we cannot anticipate all of the ways in which the current economic and geopolitical climate and financial market conditions could adversely impact our business.

Failure to maintain effective internal control over financial reporting and disclosure controls and procedures could harm our business and negatively impact investor confidence in our company and the value of our common stock.

Effective internal control over financial reporting is necessary for us to provide reliable financial reports and, together with adequate disclosure controls and procedures, are designed to prevent fraud. Any failure to implement required new or improved controls, or difficulties encountered in their implementation could cause us to fail to meet our reporting obligations. In addition, any testing by us conducted in connection with Section 404 of the Sarbanes-Oxley Act, or any subsequent testing by our independent registered public accounting firm, may reveal deficiencies in our internal control over financial reporting that are deemed to be material weaknesses or that may require prospective or retroactive changes to our financial statements, or may identify other areas for further attention or improvement. Inferior internal controls could also cause investors to lose confidence in our reported financial information, which could have a negative effect on the trading price of our stock.

We are required to disclose changes made in our internal controls and procedures on a quarterly basis, and our management is required to assess the effectiveness of these controls annually. However, for as long as we are smaller reporting company, our independent registered public accounting firm will not be required to attest to the effectiveness of our internal control over financial reporting pursuant to Section 404 of the Sarbanes-Oxley Act.

There can be no assurance that our efforts to maintain or improve our control processes will ultimately be successful or avoid potential future material weaknesses. We implemented the Restructuring in 2023, which resulted, in some instances, to different employees performing internal control activities than those who have previously performed those activities. A changing operating environment increases the risk that our system of internal controls is not designed effectively or that internal control activities will not occur as designed. The Restructuring and any further departures of accounting or finance function employees or consultants, or of individuals in other business areas responsible for overseeing key internal controls, may increase the likelihood of future internal controls deficiencies. If we are unable to successfully remediate any future material weaknesses in our internal control over financial reporting, or if we identify any additional material weaknesses, the accuracy and timing of our financial reporting may be adversely affected, we may be unable to maintain compliance with securities law requirements regarding timely filing of periodic reports in addition to applicable stock exchange listing requirements, investors may lose confidence in our financial reporting, and our stock price may decline as a result. We also could become subject to investigations by Nasdaq, the SEC or other regulatory authorities, which could harm our reputation and our financial condition, or divert financial and management resources from our core business.

We, or the third parties upon whom we depend, may be adversely affected by serious disasters.

Any unplanned event, such as a flood, fire, explosion, earthquake, extreme weather condition, medical epidemic, power shortage, telecommunication failure or other natural or human-made accident or incident that results in us being unable to fully use our facilities, or the facilities of third parties with which we contract, may have a material and adverse effect on our ability to operate our business and may have significant negative consequences on our financial and operating conditions. Loss of access to these facilities or operations may result in increased costs, delays in the development of our current or future product candidates or the interruption of our business operations for a substantial period of time.

There can be no assurance that the amounts of insurance that we maintain will be sufficient to satisfy any damages and losses in the event a serious disaster or similar event occurs. If our facilities, or the manufacturing facilities of our third-party contract manufacturers, are unable to operate because of an accident or incident or for any other reason, even for a short period of time, any or all of our research and development programs and commercialization efforts may be harmed.

ITEM 1B. UNRESOLVED STAFF COMMENTS.

None.

ITEM 1C. CYBERSECURITY.

Cybersecurity Risk Management and Strategy

We have designed and maintain a cybersecurity risk management program that is integrated into our overall enterprise risk management program and with other related functions, such as information technology, or IT, system architecture and vendor management; that leverages best practices and standards and that is designed to assess, identify and manage risks from cybersecurity and other information security threats. As part of this program, we periodically evaluate risks from cybersecurity threats as part of our broader risk management activities and as a component of our internal control system. In the course of our evaluation, we consider risks that may be associated both with our internally managed information technology, or IT, systems and key business functions and with sensitive data operated or managed by third-party service providers, vendors and collaborators with whom we engage.

We use the National Institute of Standards and Technology Cybersecurity Framework, or NIST CSF, as a guide to help us identify, assess and manage cybersecurity risks relevant to our business. We have designed and assessed our program based on the NIST CSF. This does not imply that we meet any particular technical standards, specifications 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. As part of our overall risk mitigation strategy, we also maintain cyber insurance coverage; however, such insurance may not be sufficient in type or amount to cover us against claims related to security breaches, cyberattacks and other relate breaches.

Key aspects of our cybersecurity risk management program include:

- risk assessments designed to help identify material cybersecurity risks to our critical systems, and information;
- dedicated personnel principally responsible for managing our cybersecurity risk assessment processes, our security controls and our response to cybersecurity incidents;
- the conduct of regular exercises and tests of our own systems to help discover potential vulnerabilities;
- the use of external service providers, where appropriate, overseen by our IT team, to assist with assessing our systems, monitoring cybersecurity threats, including the proactive identification of vulnerabilities in our systems with threat intelligence, and our defenses against cyberattacks and providing timely cybersecurity threat alerts;
- new-hire, annual and ad hoc cybersecurity awareness training for our employees, incident response personnel and senior management;
- a cybersecurity incident response plan, or the Response Plan, that includes procedures for responding to cybersecurity incidents; and
- a third-party risk management process, overseen by our IT team, for key service providers, vendors and collaborators, including a due diligence process that involves the completion of security questionnaires and risk assessments, as appropriate, on third parties who maintain material data or information to help us evaluate and verify third party information security capabilities.

Our Response Plan sets forth our response protocol for cybersecurity threats and cybersecurity events and incidents and is maintained by our cybersecurity incident response team, or CSIRT, which reviews the Response Plan on at least an annual basis. The CSIRT is comprised of IT department leaders, including our Vice President, Information and Technology, who reports to our Senior Vice President, Chief Operating Officer and Chief Financial Officer, as well as members of our executive team and other senior management. Our Response Plan is designed to provide a framework for how we identify, evaluate, escalate, respond and recover in the event of a data security breach and designates personnel who are responsible for these functions. Our IT team, utilizing the support of external vendors and software products, evaluates security alerts received from various sources, and any alert or threat that the CSIRT identifies as a cybersecurity incident is promptly evaluated and escalated in accordance with the Response Plan for further assessment. Upon confirmation that a cybersecurity incident has occurred, our CSIRT will establish an incident response team, which may include representatives from our internal departments, as well as

internal or external legal counsel or other external cybersecurity consultants or service providers. The CSIRT aims to develop a coordinated response strategy, including with respect to risk containment, notification processes, system restoration, incident documentation and assessment, data preservation and forensic analysis.

Our Response Plan is designed to ensure that cybersecurity incidents that have had or are reasonably likely to have a material effect on our business strategy, financial condition, and results of operations are promptly escalated to relevant executive officers, including our Senior Vice President, Chief Legal Officer, for further assessment of potential materiality and, if appropriate, notification to other members of our senior management team, the chairperson of the audit committee of our board of directors, or the Audit Committee, and the full board of directors, as needed, and preparation and dissemination of public disclosure.

Cybersecurity threats have not materially affected our business strategy, results of operations or financial condition to date, but we, our collaborators and our third-party vendors and service providers may in the future be the target of cybersecurity threats, any of which could have a material adverse effect on our business. For a description of the cybersecurity risks we face and potential related impacts on us, see "Risk Factors" in Part I, Item 1A of this Annual Report on Form 10-K.

Cybersecurity Governance and Oversight

Our board of directors 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. Our Audit Committee oversees management's ongoing activities related to our cybersecurity risk management program.

Our Audit Committee receives and provides feedback regarding periodic reports from management on our cybersecurity risks. In addition, management updates the Audit Committee, as necessary, regarding significant cybersecurity threats or incidents.

Our Audit Committee reports to the full board of directors regarding its activities, including those related to cybersecurity. The full board of directors also receives briefings from our executive team, informed by our Vice President, Information & Technology, on our cybersecurity risk management program, on a periodic basis.

Our executive team, including our Senior Vice President, Chief Operating Officer and Chief Financial Officer and our Senior Vice President, Chief Legal Officer, is responsible for assessing and managing our material risks from cybersecurity threats. The executive team has primary responsibility for our overall cybersecurity risk management program. Our Senior Vice President, Chief Operating Officer and Chief Financial Officer supervises our Vice President, Information and Technology, who leads the operational oversight of our company-wide cybersecurity strategy, policy, standards and processes and works across relevant departments to assess and help prepare our company and our internal cybersecurity personnel and retained external cybersecurity advisors to address cybersecurity risks. Our Vice President, Information & Technology has over 25 years of experience managing IT and cybersecurity programs, including two decades of experience implementing endpoint security, network security, incident response plans and end user training programs. Our internal cybersecurity personnel collectively have experience in cybersecurity, information security, data protection, privacy, regulatory compliance and risk management within complex and international business verticals, such as pharmaceuticals/biotechnology, technology, telecommunications and financial services, and hold several related third-party certifications related to information systems management and security.

Our executive team is informed about and monitors the prevention, detection, evaluation, mitigation, and remediation of key cybersecurity risks and incidents through various means, which may include briefings from internal security personnel, threat intelligence and other information obtained from governmental, public or private sources, including external advisors engaged by us, and alerts and reports produced by security tools deployed in the IT environment.

In an effort to deter and detect cyber threats, we annually provide all employees, including part-time and temporary, with a data protection, cybersecurity and incident response and prevention training and compliance program, which covers timely and relevant topics, including social engineering, phishing, password protection, confidential data protection, asset use and mobile security, and educates employees on the importance of reporting all incidents immediately. We also use technology-based tools to mitigate cybersecurity risks and to bolster our employee-based cybersecurity programs.

ITEM 2. PROPERTIES.

Our corporate headquarters are located in Cambridge, Massachusetts. We occupy approximately 45,000 square feet of office and laboratory space that we lease in a multi-tenant building in which our corporate headquarters are located. The lease for the

substantial majority of this space expires in March 2026. We have an option to extend the lease term for an additional five years thereafter. We believe that this office and laboratory space is sufficient to meet our current needs and that suitable additional space will be available as and when needed.

ITEM 3. LEGAL PROCEEDINGS.

From time to time, we may become subject to various legal proceedings and claims that arise in the ordinary course of our business activities. Regardless of outcome, litigation can have an adverse impact on our business, financial condition, results of operations and prospects because of defense and settlement costs, diversion of management resources and other factors. We are not currently party to any material legal proceedings.

ITEM 4. MINE SAFETY DISCLOSURES.

Not applicable.

PART II

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

Certain Information Regarding the Trading of Our Common Stock

Our common stock trades under the symbol "MRSN" on the Nasdaq Global Select Market. As of February 23, 2024, there were 14 holders of record of shares of our common stock. The actual number of stockholders is greater than this number of record holders, and includes stockholders who are beneficial owners, but whose shares are held in street name by brokers and other nominees.

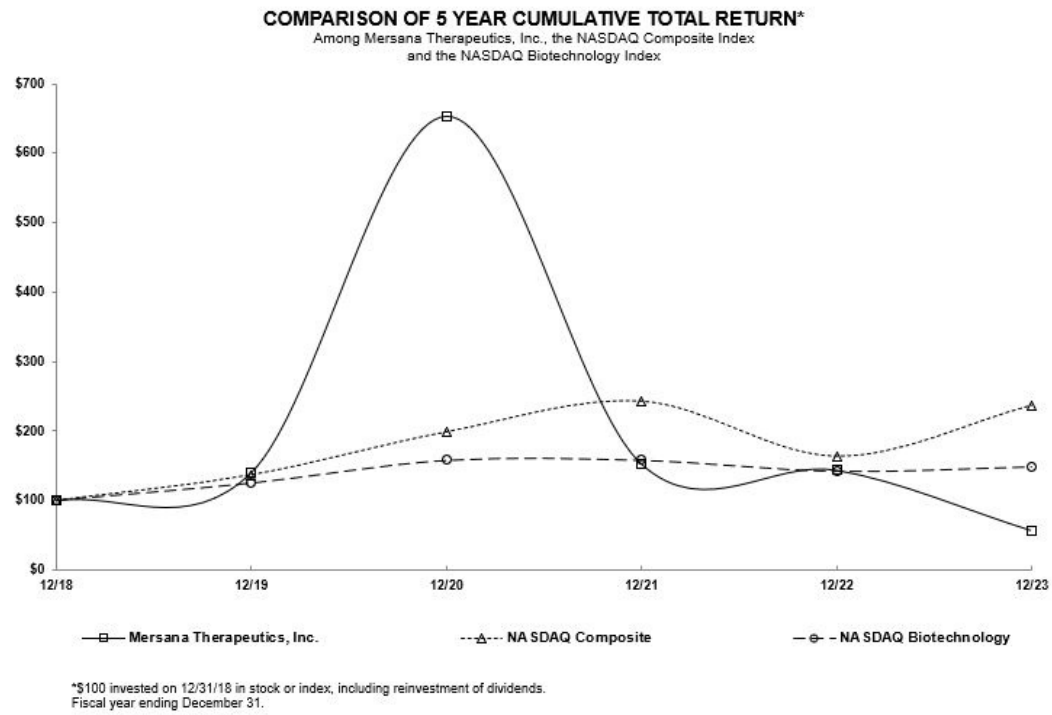
Dividend Policy

We have never declared nor paid cash dividends on our common stock. We currently intend to retain all of our future earnings, if any, to finance the growth and development of our business. We do not intend to pay cash dividends in respect of our common stock in the foreseeable future. In addition, our current credit facility contains restrictive covenants that prohibit us, subject to certain exceptions, from paying dividends on our common stock. Any future determination to pay cash dividends will be made at the discretion of our board of directors and will depend on restrictions and other factors our board of directors may deem relevant. Investors should not purchase our common stock with the expectation of receiving cash dividends.

Stock Performance Graph

The following performance graph and related information shall not be deemed to be "soliciting material" or to be "filed" with the Securities and Exchange Commission, or SEC, for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or the Exchange Act, nor shall such information be incorporated by reference into any future filing under the Exchange Act or Securities Act of 1933, as amended, or the Securities Act, except to the extent that we specifically incorporate it by reference into such filing.

The following graph compares the performance of our common stock to the Nasdaq Composite Index and to the Nasdaq Biotechnology Index from December 31, 2018 through December 31, 2023, which was the last trading day of the year. The comparison assumes $100 was invested in our common stock and in each of the foregoing indices after the market closed on December 31, 2018, and it assumes reinvestment of dividends, if any. The stock price performance included in this graph is not necessarily indicative of future stock price performance.



Recent Sales of Unregistered Securities

None.

Purchases of Equity Securities by the Issuer and Affiliates Purchasers

Neither we nor any affiliated purchaser or anyone acting on behalf of us or an affiliated purchaser made any purchases of shares of our common stock during the fourth quarter of 2023.

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 audited financial statements and related notes appearing elsewhere in this Annual Report on Form 10-K.

Our actual results and timing of certain events may differ materially from the results discussed, projected, anticipated, or indicated in any forward-looking statements. We caution you that forward-looking statements are not guarantees of future performance and that our actual results of operations, financial condition and liquidity, and the development of the industry in which we operate may differ materially from the forward-looking statements contained in this Annual Report. In addition, even if our results of operations, financial condition and liquidity, and the development of the industry in which we operate are consistent with the forward-looking statements contained in this Annual Report, they may not be predictive of results or developments in future periods.

The following information and any forward-looking statements should be considered in light of factors discussed elsewhere in this Annual Report on Form 10-K, including those risks identified under Part II, Item 1A. Risk Factors.

We caution readers not to place undue reliance on any forward-looking statements made by us, which speak only as of the date they are made. We disclaim any obligation, except as specifically required by law and the rules of the Securities and Exchange Commission, or SEC, to publicly update or revise any such statements to reflect any change in our expectations or in events, conditions or circumstances on which any such statements may be based, or that may affect the likelihood that actual results will differ from those set forth in the forward-looking statements.

For our discussion and analysis of the year ended December 31, 2022 compared to the year ended December 31, 2021, please refer to "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations" in our Annual Report on Form 10-K for the year ended December 31, 2022, as filed with the SEC on February 28, 2023.

Overview

We are a clinical-stage biopharmaceutical company focused on developing antibody-drug conjugates, or ADCs, that offer a clinically meaningful benefit for cancer patients with significant unmet need. We have leveraged decades of industry learnings to develop two proprietary and differentiated ADC platforms: Dolasynthen and Immunosynthen. Dolasynthen is our cytotoxic ADC platform that is designed to generate site-specific, homogeneous ADCs. Dolasynthen allows for drug-to-antibody ratios, or DARs, to be optimized for specific targets and utilizes a proprietary auristatin payload that has been shown clinically to avoid dose-limiting severe neutropenia, peripheral neuropathy and ocular toxicity. Immunosynthen is our proprietary STING (stimulator of interferon genes)-agonist platform that is designed to generate systemically administered ADCs that locally activate STING signaling in both antigen-expressing tumor cells and in tumor-resident immune cells to unlock the anti-tumor potential of innate immune stimulation. We are utilizing these platforms to generate ADC product candidates for our company and collaborators that we believe have the potential to improve upon today's standards of care.

Our two clinical-stage product candidates are XMT-1660 and XMT-2056. XMT-1660 is a B7-H4-targeting Dolasynthen ADC designed with a precise, target-optimized DAR of 6 that we are investigating in a Phase 1 clinical trial that is currently enrolling patients with various tumors, including breast, endometrial and ovarian cancers. XMT-2056 is a systemically-administered Immunosynthen ADC targeting a novel human epidermal growth factor receptor 2, or HER2, epitope with a DAR of 8 that we are investigating in a Phase 1 clinical trial for patients with HER2-expressing advanced or recurrent solid tumors, including breast, gastric, colorectal and non-small cell lung cancers.

We also have two earlier stage preclinical candidates, which we refer to as XMT-2068 and XMT-2175, that leverage our Immunosynthen platform.

In July 2023, we announced that our UPLIFT registrational trial of XMT-1536, otherwise known as upifitimab rilsodotin, or UpRi, had failed to meet its primary endpoint, that we had decided to discontinue the development of UpRi and that we would wind-down our UpRi-related development activities, including several clinical trials of UpRi, and our regulatory and commercial readiness efforts. At the same time, we announced that our board of directors had approved certain expense reduction measures, including a reduction of approximately 50% of our then-current employee base, or the Restructuring. Our wind-down of UpRi-related activities and the Restructuring were substantially complete as of December 31, 2023. Additionally, in May 2022, we made the decision to discontinue the development of XMT-1592, a Dolasynthen ADC that had been in a Phase 1 dose exploration trial in patients with ovarian cancer and non-small cell lung cancer, or NSCLC, and to close this company-sponsored trial, which was completed in September 2022.

We have entered into a global collaboration providing GlaxoSmithKline Intellectual Property (No. 4) Limited, or GSK, an exclusive option to co-develop and commercialize XMT-2056. In addition, we have established strategic research and development collaborations with Janssen Biotech, Inc., or Johnson & Johnson, and Ares Trading, S.A., a wholly-owned subsidiary Merck KGaA, Darmstadt, Germany, or each of these entities, as applicable, Merck KGaA, for the development and commercialization of additional ADC product candidates leveraging our proprietary platforms against a limited number of targets selected by our collaborators. We believe the potential of our ADC product candidates and platforms, supported by our scientific and technical expertise and enabled by our intellectual property strategy, all support our independent and collaborative efforts to discover and develop life-changing ADCs for patients fighting cancer.

Since inception, our operations have focused on building our platforms, identifying potential product candidates, producing drug substance and drug product material for use in preclinical studies, conducting preclinical and toxicology studies, manufacturing clinical trial material and conducting clinical trials, establishing and protecting our intellectual property, staffing our company and raising capital. We do not have any products approved for sale and have not generated any revenue from product sales. We have funded our operations primarily through our strategic collaborations, private placements of our convertible preferred stock and public offerings of our common stock, including through our at-the-market, or ATM, equity offering programs.

Since inception, we have incurred significant cumulative operating losses. Our net losses were $171.7 million, $204.2 million and $170.1 million for the years ended December 31, 2023, 2022 and 2021, respectively. As of December 31, 2023, we had an accumulated deficit of $826.4 million. We expect to continue to incur significant expenses and operating losses over the next several years as we:

- continue clinical development and manufacturing activities for XMT-1660 and XMT-2056;
- continue activities to discover, validate and develop additional product candidates, including XMT-2068 and XMT-2175;
- conduct research and development activities under our collaborations with Johnson & Johnson, Merck KGaA and GSK;
- obtain marketing approvals for our current and future product candidates for which we complete clinical trials;
- develop a sustainable and scalable manufacturing process for our product candidates, including establishing and maintaining commercially viable supply and manufacturing relationships with third parties;
- address any competing technological and market developments;
- maintain, expand and protect our intellectual property portfolio; and
- hire additional research, development and general and administrative personnel.

Financial Operations Overview

Revenue

To date, we have not generated any revenue from the sale of products. All of our revenue has been generated from strategic collaborations.

In December 2022, we entered into a collaboration and commercial license agreement, or the 2022 Merck KGaA Agreement, with Ares Trading S.A., a wholly-owned subsidiary of Merck KGaA, Darmstadt, Germany. The 2022 Merck KGaA Agreement provides for the development and commercialization of ADC product candidates utilizing our Immunosynthen platform for up to two target antigens. Merck KGaA is responsible for generating antibodies against the target antigens, and we are responsible for performing bioconjugation activities to create ADCs as well as certain chemistry, manufacturing and controls development and early-stage manufacturing activities at Merck KGaA's cost. Merck KGaA has the exclusive right to and is responsible for the further development and commercialization of these ADC product candidates. During the year ended December 31, 2023, we recognized $10.7 million related to the 2022 Merck KGaA Agreement. We did not recognize revenue related to the 2022 Merck KGaA Agreement during the year ended December 31, 2022.

In August 2022, we entered into a collaboration, option and license agreement, or the GSK Agreement, with GSK to provide GSK with an exclusive option to obtain an exclusive license to co-develop and to commercialize products containing XMT-2056, or Licensed Products. We are responsible for manufacturing, research and early clinical development related to our XMT-2056 program prior to GSK's exercise, if any, of its option. If GSK exercises its option, GSK will have the exclusive right to and will be responsible for the further co-development and commercialization of Licensed Products. During the years ended December 31, 2023 and 2022, we recognized $3.4 million and $2.0 million, respectively, of collaboration revenue related to the GSK Agreement.

In February 2022, we entered into a research collaboration and license agreement, or the Johnson & Johnson Agreement, with Janssen Biotech, Inc., or Johnson & Johnson, for the development and commercialization of ADC product candidates utilizing our Dolasynthen platform for up to three target antigens. We refer to such agreement, as amended on July 14, 2023 and September 25, 2023, as the Johnson & Johnson Agreement. Johnson & Johnson is responsible for generating antibodies against the target antigens, and we are responsible for performing bioconjugation activities to create ADCs as well as certain chemistry, manufacturing and controls development and early-stage manufacturing activities at Johnson & Johnson's cost. Johnson & Johnson has the exclusive right to and is responsible for the further development and commercialization of these ADC product candidates. During the years ended December 31, 2023 and 2022, we recognized $16.6 million and $24.2 million, respectively, of collaboration revenue related to performance under the Johnson & Johnson Agreement, including achievement of development milestones.

In June 2014, we entered into a collaboration and commercial license agreement, or the 2014 Merck KGaA Agreement, with Merck KGaA, Darmstadt, Germany, for the development and commercialization of ADC product candidates utilizing our Dolaflexin platform for up to six target antigens. In May 2018, we entered into a supply agreement, or the 2018 Merck KGaA Supply Agreement, with Merck KGaA, Darmstadt, Germany, for the supply of materials that could be used for investigational new drug, or IND, -enabling studies and clinical trials. On December 15, 2023, we and Merck KGaA mutually agreed to terminate both the 2014 Merck KGaA Agreement and the 2018 Merck Supply Agreement. During the years ended December 31, 2023 and 2022, we recognized $3.7 million and a de minimis amount, respectively, of revenue related to the 2014 Merck KGaA Agreement and 2018 Merck KGaA Supply Agreement.

During the years ended December 31, 2023 and 2022, we recognized $2.5 million and $0.3 million, respectively, of revenue related to achievement of a development milestone and services provided, respectively, related to our collaboration agreement with Asana Biosciences, LLC, or Asana Biosciences.

For the foreseeable future, we expect substantially all of our revenue to be generated from our ongoing collaboration agreements with GSK, Johnson & Johnson and Merck KGaA. Given the uncertain nature and timing of clinical development, we cannot predict when or whether we will receive further milestone payments or any royalty payments under these collaborations.

Expenses

Research and development expenses

Research and development expenses include our drug discovery efforts, manufacturing, and the development of our product candidates, which consist of:

- employee-related expenses, including salaries, benefits and stock-based compensation expense;
- costs of funding research and development performed by third parties that conduct research, preclinical activities, manufacturing and clinical trials on our behalf;
- laboratory supplies;
- facility costs, including rent, depreciation and maintenance expenses; and
- upfront and milestone payments under our third-party licensing agreements.

Research and development costs are expensed as incurred. Costs of certain activities, such as manufacturing, preclinical studies and clinical trials, are generally recognized based on an evaluation of the progress to completion of specific tasks. Costs for certain development activities, such as clinical trials, are recognized based on an evaluation of the progress to completion of specific tasks using data such as patient enrollment, clinical site activations and information provided to us by the third parties with whom we contract.

Research and development activities are central to our business model. Product candidates in later stages of clinical development generally have higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials and manufacturing costs. We expect that our future research and development costs will continue to increase over current levels, depending on the progress of our clinical development programs. There are numerous factors associated with the successful development and commercialization of any of our product candidates, including future trial design and various regulatory requirements, many of which cannot be determined with accuracy at our current stage of development. Additionally, future commercial and regulatory factors beyond our control may impact our clinical development programs and plans.

We have not historically allocated all of our internal research and development expenses on a program-by-program basis as our employees and other resources are deployed across multiple projects under development. Internal research and development expenses are presented as one total. Our internal research and development costs are primarily personnel-related costs, stock-based compensation costs, and facility costs, including depreciation and lab consumables.

We incur significant external costs for manufacturing our product candidates and platforms and for clinical research organizations that conduct clinical trials on our behalf. We capture these external expenses for each product candidate in clinical development. Costs for our platforms with an associated product candidate in clinical development are typically allocated to our most clinically advanced product candidate based on that platform. In light of our decision to discontinue further clinical development of XMT-1592, a Dolasynthen ADC that had been in a Phase 1 dose exploration trial in patients with ovarian cancer and non-small cell lung cancer, in the second quarter of 2022, all costs associated with our Dolasynthen platform were prospectively re-allocated to XMT-1660, which is now our lead Dolasynthen-based product candidate, following such decision. All external research and development expenses not attributable to our product candidates in clinical development are captured within preclinical and discovery costs. These costs relate to our product candidates XMT-2068 and XMT-2175 and additional earlier discovery stage programs and certain unallocated costs. The following table summarizes our external research and development expenses, presented by program as described above, for each of the years ended December 31, 2023, 2022, and 2021.

(in thousands)	Year Ended December 31, 2023	2022	2021
UpRi external costs	$ 48,902	$ 66,119	$ 45,511
XMT-1660 external costs	14,098	15,032	—
XMT-2056 external costs	5,812	4,981	—
XMT-1592 external costs	434	3,802	9,126
Preclinical and discovery costs	4,441	14,991	28,464
Internal research and development costs	74,582	68,460	48,912
Total research and development costs	$ 148,269	$ 173,385	$ 132,013

The successful development of our product candidates is highly uncertain. As such, we cannot reasonably estimate or know the nature, timing and estimated costs of the efforts that will be necessary to complete the remainder of the development of our product candidates. We are also unable to predict when, if ever, we will generate revenue from commercialization and sale of any of our product candidates that obtain regulatory approval. This is due to the numerous risks and uncertainties associated with developing drugs, including the uncertainty of:

- successful completion of preclinical studies and IND-enabling studies;
- successful enrollment in and completion of clinical trials;
- receipt of marketing approvals from applicable regulatory authorities;
- establishing commercial manufacturing capabilities or making arrangements with third-party manufacturers;
- obtaining and maintaining patent and trade secret protection and regulatory exclusivity for our product candidates;
- commercializing the product candidates, if and when approved, whether alone or in collaboration with others; and
- continued acceptable safety profile of the drugs following approval.

A change in the outcome of any of these variables with respect to the development, manufacture or commercialization of any of our product candidates would significantly change the costs, timing and viability associated with the development of that product candidate.

For example, on July 27, 2023 we announced our decision to discontinue the clinical development of UpRi. Consequently, we have allocated resources previously dedicated to this program into our next-generation ADCs and platforms, Dolasynthen and Immunosynthen. We expect to incur significant research and development expenses over the next several years as we continue our clinical development and manufacturing of XMT-1660 and XMT-2056, advance our preclinical pipeline and invest in improvements in our ADC technologies.

General and administrative expenses

General and administrative expenses consist primarily of salaries and other employee-related costs, including stock-based compensation, for personnel in executive, finance, accounting, business development, legal operations, information technology and human resources functions. Other significant costs include facility costs not otherwise included in research and development expenses, legal fees relating to patent and corporate matters and fees for accounting and other consulting services.

We expect to incur significant general and administrative expenses over the next several years to support continued research and development activities, including increased costs related to fees to outside consultants and patent costs, among other expenses.

Restructuring expenses

Restructuring expenses consists primarily of severance and benefit payments, notice pay, outplacement services and contract termination costs. During the year ended December 31, 2023, we recognized $8.7 million of such expenses. The Restructuring was substantially completed as of December 31, 2023.

Other income (expense)

Other income (expense) consists primarily of interest expense related to borrowings under our credit facility and associated amortization of the deferred financing costs and the accretion of debt discount. Interest income includes interest earned on cash equivalents and marketable securities.

Results of Operations

Comparison of Years Ended December 31, 2023 and 2022

The following table summarizes our results of operations for the years ended December 31, 2023 and 2022, together with the changes in those items:

	Year Ended December 31,		
(in thousands)	**2023**	**2022**	**Dollar Change**
Collaboration revenue	$ 36,855	$ 26,581	$ 10,274
Operating expenses:			
Research and development	148,269	173,385	(25,116)
General and administrative	59,543	56,963	2,580
Restructuring expenses	8,713	—	8,713
Total operating expenses	216,525	230,348	(13,823)
Other income (expense):			
Interest income	12,073	2,883	9,190
Interest expense	(4,073)	(3,328)	(745)
Total other income (expense), net	8,000	(445)	8,445
Net loss	$ (171,670)	$ (204,212)	$ 32,542

Collaboration Revenue

Collaboration revenue increased by $10.3 million during the year ended December 31, 2023 as compared to the year ended December 31, 2022, primarily due to an increase of $14.3 million in collaboration revenue recognized under the 2022 Merck KGaA Agreement and the 2014 Merck KGaA Agreement and $3.2 million related to early development milestones achieved under the Johnson & Johnson Agreement, partially offset by a decrease of $10.8 million in collaboration revenue recognized under the Johnson & Johnson Agreement.

Research and Development Expense

Research and development expense decreased by $25.1 million from $173.4 million for the year ended December 31, 2022 to $148.3 million for the year ended December 31, 2023.

The decrease in research and development expense was primarily due to the following:

- a decrease of $17.3 million related to manufacturing and clinical development activities for UpRi as a result of the Restructuring;
- a decrease of $5.5 million primarily related to manufacturing activities for XMT-1660 and the Dolasynthen platform;
- a decrease of $3.2 million related to manufacturing and clinical development activities for XMT-2056; and
- a decrease of $2.0 million related to non-refundable license payments under our third-party licensing agreements.

These decreased expenses were partially offset by an increase of $2.8 million related to clinical development activities for XMT-1660.

General and Administrative Expense

General and administrative expense increased by $2.6 million from $57.0 million for the year ended December 31, 2022 to $59.5 million for the year ended December 31, 2023. The increase in general and administrative expense was primarily due to an increase of $2.9 million related to employee compensation (excluding stock-based compensation) as a result of an increase in headcount prior to the Restructuring, partially offset by a decrease of $0.3 million related to consulting and professional services.

Total Other Income (Expense), Net

Total other income (expense), net increased by $8.4 million from $(0.4) million during the year ended December 31, 2022 to $8.0 million during the year ended December 31, 2023. The increase to the net balance was primarily due to an increase in interest income earned on cash equivalents and marketable securities.

Liquidity and Capital Resources

Sources of Liquidity

We have financed our operations to date primarily through our strategic collaborations, private placements of our convertible preferred stock and public offerings of our common stock, including our initial public offering, our follow-on public offerings in 2019 and 2020 and our ATM equity offering programs.

In May 2020, we established an ATM equity offering program, or the 2020 ATM, pursuant to which we were able to offer and sell to the public through Cowen and Company, LLC, or Cowen, as sales agent, up to $100.0 million of our common stock from time to time at prevailing market prices. During the year ended December 31, 2021, we sold approximately 4.0 million shares of common stock under the 2020 ATM, resulting in gross proceeds and net proceeds of $44.1 million and $43.1 million, respectively. During the year ended December 31, 2022, we sold approximately 11.7 million shares of common stock under the 2020 ATM, resulting in gross proceeds and net proceeds of $55.9 million and $54.8 million, respectively. As of December 31, 2022, there were no amounts remaining unsold and available for sale under the 2020 ATM.

In February 2022, we entered into a new sales agreement, or the February 2022 ATM, with Cowen, as sales agent, under which we are able to offer and sell to the public through Cowen up to $100.0 million of our common stock from time to time at prevailing market prices. During the year ended December 31, 2022, we sold approximately 18.8 million shares of common stock under the February 2022 ATM, resulting in gross proceeds and net proceeds of $98.4 million and $96.4 million, respectively. During the year ended December 31, 2023, we sold approximately 0.3 million shares of common stock under the February 2022 ATM, resulting in gross and net proceeds of $1.6 million. As of December 31, 2023, there were no amounts remaining unsold and available for sale under the February 2022 ATM.

In November 2022, we entered into an additional sales agreement, or the November 2022 ATM, with Cowen, as sales agent, under which we are able to offer and sell to the public through Cowen up to $150.0 million of our common stock from time to time at prevailing market prices. During the year ended December 31, 2023, we sold approximately 14.2 million shares of common stock under the November 2022 ATM, resulting in gross proceeds and net proceeds of $94.1 million and $92.2 million, respectively. Approximately $55.9 million remained unsold and available for sale under the November 2022 ATM as of December 31, 2023.

On May 8, 2019, we entered into a loan and security agreement, or the Prior Credit Facility, with Silicon Valley Bank, or former SVB, which was subsequently amended on June 29, 2019, August 28, 2020 and August 27, 2021. On October 29, 2021, we entered into a loan and security agreement, or the New Credit Facility, with Oxford Finance LLC as the collateral agent and a lender, former SVB as a lender, and the other lenders from time to time a party thereto, or together the Lenders. In March 2023, Silicon Valley Bridge Bank, N.A., or SVBB, as successor in interest to former SVB, replaced former SVB as a Lender, and then Silicon Valley Bank, a division of First-Citizens Bank & Trust Company, or SVB, which assumed all deposits and loans of SVBB, subsequently replaced SVBB as a lender. As of December 31, 2023, we have borrowed $25.0 million under the New Credit Facility, as amended on February 17, 2022, October 17, 2022, December 27, 2022 and March 23, 2023, and no additional borrowing amounts are available to us under the New Credit Facility, as amended to date. We are obligated to make interest-only payments through November 1, 2024, followed by equal monthly principal payments and applicable interest through the maturity date of October 1, 2026. The New Credit Facility is secured by substantially all of our personal property owned or later acquired, excluding intellectual property (but including the right to payments and proceeds of intellectual property), and a negative pledge on intellectual property, which ensures that the Lenders' rights to repayment would be senior to the rights of the holders of our common stock in the event of liquidation. Upon entering into the New Credit Facility, we terminated all commitments by former SVB to extend further credit under the Prior Credit Facility and all guarantees and security interests granted by us to former SVB under the Prior Credit Facility.

As of December 31, 2023, we had cash and cash equivalents and marketable securities of $209.1 million. In addition to our existing cash, cash equivalents and marketable securities, we are eligible to earn milestone and other payments under our ongoing collaboration agreements with GSK, Johnson & Johnson and Merck KGaA. Our ability to earn the milestone payments and the timing of earning these amounts are dependent upon the timing and outcome of our development, regulatory and commercial activities and, as such, are uncertain at this time.

Cash Flows

The following table provides information regarding our cash flows for the years ended December 31, 2023, 2022 and 2021:

	Year Ended December 31,		
(in thousands)	**2023**	**2022**	**2021**
Net cash used in operating activities	$ (168,882)	$ (49,363)	$ (139,988)
Net cash provided by (used in) investing activities	119,883	(152,716)	(648)
Net cash provided by financing activities	94,675	153,017	63,646
Increase (decrease) in cash, cash equivalents and restricted cash	$ 45,676	$ (49,062)	$ (76,990)

Net Cash Used in Operating Activities

Net cash used in operating activities was $168.9 million for the year ended December 31, 2023 and primarily consisted of a net loss of $171.7 million adjusted for changes in our net working capital, deferred revenue related to our collaboration agreements, and other non-cash items, including stock-based compensation of $21.1 million and net amortization of premiums and discounts on marketable securities of $4.6 million. Net cash used in operating activities was $49.4 million for the year ended December 31, 2022 and primarily consisted of a net loss of $204.2 million adjusted for changes in our net working capital, deferred revenue related to our collaboration agreements, and other non-cash items, including stock-based compensation of $21.5 million.

Net Cash Provided by (Used in) Investing Activities

Net cash provided by investing activities was $119.9 million during the year ended December 31, 2023 as compared to net cash used in investing activities of $152.7 million during the year ended December 31, 2022. During the year ended December 31, 2023, net cash provided by investing activities consisted primarily of maturities of marketable securities, partially offset by purchases of marketable securities. Net cash used in investing activities for the year ended December 31, 2022 consisted primarily of purchases of marketable securities, partially offset by maturities of marketable securities.

Net Cash Provided by Financing Activities

Net cash provided by financing activities was $94.7 million during the year ended December 31, 2023 as compared to $153.0 million during the year ended December 31, 2022. During the year ended December 31, 2023 net cash provided by financing activities consisted primarily of proceeds from sales of shares of common stock under our February 2022 ATM and November 2022 ATM of $93.5 million. During the year ended December 31, 2022 net cash provided by financing activities consisted primarily of proceeds from the use of our 2020 ATM and February 2022 ATM of $150.9 million.

Funding Requirements

We expect our cash expenditures to increase in connection with our ongoing activities, particularly as we continue the research and development and manufacturing of, initiate clinical trials of and seek marketing approval for our product candidates. In addition, if we obtain marketing approval for any of our product candidates, we expect to incur significant commercialization expenses related to drug sales, marketing, manufacturing and distribution to the extent that such sales, marketing and distribution are not the responsibility of potential collaborators.

As of December 31, 2023, we had cash, cash equivalents and marketable securities of $209.1 million. We believe our currently available funds will be sufficient to fund our current operating plan commitments into 2026. Our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement and involves risks and uncertainties, and actual results could vary as a result of a number of factors. We have based this estimate on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we currently expect. Our future capital requirements will depend on many factors, including:

- the scope, progress, results and costs of drug discovery, preclinical development, laboratory testing and clinical trials for our product candidates;
- the scope, prioritization and number of our research and development programs;
- the costs, timing and outcome of regulatory review of our product candidates;
- our ability to establish and maintain collaborations on favorable terms, if at all;
- the achievement of milestones or occurrence of other developments that trigger payments under any collaboration agreements we obtain;
- the extent to which we are obligated to reimburse, or entitled to reimbursement of, clinical trial costs under future collaboration agreements, if any;
- the costs of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending intellectual property-related claims;
- the extent to which we acquire or in-license other product candidates and technologies;
- the costs of securing manufacturing arrangements for clinical and commercial production; and
- the costs of establishing or contracting for sales and marketing capabilities if we obtain regulatory approvals to market our product candidates.

Identifying potential product candidates and conducting preclinical testing and clinical trials is a time-consuming, expensive and uncertain process that takes many years to complete, and we may never generate the necessary data or results required to obtain marketing approval and achieve drug sales. In addition, our product candidates, if approved, may not achieve commercial success. Our commercial revenues, if any, will be derived from sales of drugs 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.

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through a combination of strategic collaborations, licensing arrangements, equity offerings and debt financings. We have the potential to earn cash milestone payments in connection with our ongoing agreements with GSK, Johnson & Johnson and Merck KGaA, if research and development activities are successful under our collaborations with those parties. If we raise funds through additional strategic collaborations or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or to 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 drug development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

To the extent that we raise additional capital through the sale of equity or convertible debt securities, the ownership interests of our common stockholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect the rights of our common stockholders. Future additional 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.

Contractual Obligations

Our material cash requirements from known contractual obligations as of December 31, 2023 primarily consist of operating and finance lease liabilities and principal and interest payments under our New Credit Facility. Our total future minimum lease payments for our finance and operating leases are included in Note 12, *Leases,* in the Notes to Consolidated Financial Statements. The total future undiscounted minimum lease payments, including operating and finance leases, were $9.7 million as of December 31, 2023. Our total future minimum principal payments under our New Credit Facility are included in Note 8, *Debt,* in the Notes to Consolidated Financial Statements. The total future minimum principal payments under our New Credit Facility were $25.0 million as of December 31, 2023.

We enter into agreements in the normal course of business with third parties to assist us with preclinical, clinical, manufacturing, and other products and services for operating purposes. These agreements are generally cancellable at any time by us upon reasonable notice, and certain of these agreements include termination rights subject to termination fees or wind down costs. The exact amounts of such obligations are dependent on the timing of termination and the exact terms of the relevant agreement and cannot be reasonably estimated.

We also have obligations to make future payments to third parties that become due and payable on the achievement of certain milestones, including future payments to third parties with whom we have entered into license agreements. We have not included these commitments on our balance sheet because the achievement and timing of these milestones is not fixed and determinable.

In January 2019, we entered into a commercial license agreement with Synaffix B.V., or Synaffix, which we amended and restated in November 2021 and February 2022 to expand our relationship with Synaffix. We refer to the amended and restated agreement as the Synaffix License. Under the Synaffix License, we have the right to develop, manufacture and commercialize ADCs directed to targets using Synaffix's proprietary site-specific conjugation technology. We have licensed five targets in connection with our development programs and collaborations, and we have the right to license up to six additional targets. We have paid $6.8 million related to the Synaffix License, comprised of $4.0 million in reservation and license fees, $1.8 million in milestone payments and $1.0 million which may be applied to future reservation and license fees, as well as certain portions of potential future development milestones. We will be obligated to pay in the range of $48.0 million to $132.0 million for issuance, development, regulatory and commercial milestones. Upon commencement of commercial sales of any ADC product directed to a licensed target, if any, we are required to pay to Synaffix tiered royalties in the low-single digit percentages on net sales of the respective products. The Synaffix License remains in effect on a country-by-country and licensed product-by-licensed product basis until the expiration of the last-to-expire valid claim in a patent licensed under the Synaffix License covering such product in such country. Upon the expiration of the Synaffix License for each licensed product in each country, the licenses granted to us for such product in such country will become fully paid-up and perpetual. We may terminate the Synaffix License in its entirety or on a licensed product-by-licensed product basis at any time. Either party may terminate the Synaffix License, subject to a specified notice and cure period, for a breach by the other party of a material provision of the agreement or upon an insolvency-related event experienced by the other party.

Critical Accounting Policies and Significant Judgements and Estimates

Our management's discussion and analysis of our financial condition and results of operations are based on our financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles. The preparation of these financial statements requires us to make judgments and estimates that affect the reported amounts of assets, liabilities, revenues, and expenses and the disclosure of contingent assets and liabilities in our financial statements. We base our estimates on historical experience, known trends and events, and various other factors that are believed to be reasonable under the circumstances. Actual results may differ from these estimates under different assumptions or conditions. On an ongoing basis, we evaluate our judgments and estimates in light of changes in circumstances, facts and experience. The effects of material revisions in estimates, if any, will be reflected in the financial statements prospectively from the date of change in estimates.

We believe that our most critical accounting policies are those relating to revenue recognition and accrued research and development expenses as discussed in the Notes to Consolidated Financial Statements included in this Annual Report on Form 10-K.

Revenue Recognition

We enter into collaboration agreements which are within the scope of Accounting Standards Update 2014-09, *Revenue from Contracts with Customers*, or ASC 606, under which we license rights to our technology and certain of our product candidates and perform research and development services for third parties. The terms of these arrangements typically include payment of one or more of the following: non-refundable, up-front fees; reimbursement of research and development costs; development, regulatory and commercial milestone payments; and royalties on net sales of licensed products.

Under ASC 606, an entity recognizes revenue when its customer obtains control of promised goods or services, in an amount that reflects the consideration which the entity expects to receive in exchange for those goods or services. To determine the appropriate amount of revenue to be recognized for arrangements determined to be within the scope of ASC 606, we perform the following five steps: (i) identification of contract(s) with a customer; (ii) determination of whether the promised goods or services are performance obligations; (iii) measurement of the transaction price, including the constraint on variable consideration; (iv) allocation of the transaction price to the performance obligations; and (v) recognition of revenue when (or as) we satisfy each performance obligation. We only apply the five-step model to contracts when it is probable that the entity will collect consideration it is entitled to in exchange for the goods or services it transfers to the customer.

The promised good or services in our arrangements typically consist of license rights to our intellectual property and research and development services. We also have optional additional items in contracts, which are considered marketing offers and are accounted for as separate contracts with the customer if such option is elected by the customer, unless the option provides a material right which would not be provided without entering into the contract. Performance obligations are promised goods or services in a contract to transfer a distinct good or service to the customer. Promised goods or services are considered distinct when (i) the customer can benefit from the good or service on its own or together with other readily available resources or (ii) the promised good or service is separately identifiable from other promises in the contract. In assessing whether promised goods or services are distinct, we consider factors such as the stage of development of the underlying intellectual property, the capabilities of the customer to develop the intellectual property on their own or whether the required expertise is readily available.

We estimate the transaction price based on the amount expected to be received for transferring the promised goods or services in the contract. The consideration may include both fixed consideration and variable consideration. At the inception of each arrangement that includes variable consideration and at each reporting period, we evaluate the amount of potential payment and the likelihood that the payments will be received. We utilize either the most likely amount method or expected amount method to estimate the amount expected to be received based on which method better predicts the amount expected to be received. If it is probable that a significant revenue reversal would not occur, the variable consideration is included in the transaction price.

Our contracts often include development and regulatory milestone payments. At contract inception and at each reporting period, we evaluate whether the milestones are considered probable of being reached and estimate the amount to be included in the transaction price using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in the transaction price. Milestone payments that are not within our control or the licensee’s control, such as regulatory approvals, are not included in the transaction price. At the end of each subsequent reporting period, we re-evaluate the probability of achievement of such development milestones and any related constraint, and if necessary, adjust our estimate of the overall transaction price.

For arrangements that include sales-based royalties, including milestone payments based on the level of sales, and the license is deemed to be the predominant item to which the royalties relate, we recognize revenue at the later of (i) when the related sales occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied (or partially satisfied).

We allocate the transaction price based on the estimated standalone selling price of the underlying performance obligations or in the case of certain variable consideration to one or more performance obligations. We must develop assumptions that require judgment to determine the standalone selling price for each performance obligation identified in the contract. We utilize key assumptions to determine the standalone selling price, which may include other comparable transactions, pricing considered in negotiating the transaction and the estimated costs to complete the respective performance obligation. Certain variable consideration is allocated specifically to one or more performance obligations in a contract when the terms of the variable consideration relate to the satisfaction of the performance obligation and the resulting amounts allocated to each performance obligation are consistent with the amounts we would expect to receive for each performance obligation.

For performance obligations consisting of licenses and other promises, we utilize judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress for purposes of recognizing revenue from non-refundable, up-front fees. We evaluate the measure of progress each reporting period and, if necessary, adjust the measure of performance and related revenue recognition. If the license to our intellectual property is determined to be distinct from the other performance obligations identified in the arrangement, we will recognize revenue from non-refundable, up-front fees allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license.

Collaborative Arrangements

We record the elements of our collaboration agreements that represent joint operating activities in accordance with ASC 808, *Collaborative Arrangements*. Accordingly, the elements of the collaboration agreements that represent activities in which both parties are active participants and to which both parties are exposed to the significant risks and rewards that are dependent on the commercial success of the activities, are recorded as collaborative arrangements. We consider the guidance in ASC 606 in determining the appropriate treatment for the transactions between us and our collaborators and the transactions between us and third parties. Generally, the classification of transactions under the collaborative arrangements is determined based on the nature and contractual terms of the arrangement along with the nature of the operations of the participants. To the extent revenue is generated from a collaboration, we will recognize our share of the net sales on a gross basis if we are deemed to be the principal in the transactions with customers, or on a net basis if we are instead deemed to be the agent in the transactions with customers, consistent with the guidance in ASC 606.

Accrued Research and Development Expenses

As part of the process of preparing our financial statements, we are required to estimate our accrued expenses as of each balance sheet date. This process involves 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. The majority of our service providers invoice us monthly in arrears for services performed or when contractual milestones are met. 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 record our expenses related to research and development activities based upon our estimates of the services received and efforts expended pursuant to quotes and contracts with vendors that conduct research and development on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. 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, enrollment of subjects, number of sites activated 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 accrued or prepaid expense balance accordingly. 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, we may report amounts that are too high or too low in any particular period. To date, there have been no material differences from our estimates to the amounts actually incurred. Significant judgement is involved in making the above estimates.

Recent accounting pronouncements

See Note 2, *Summary of significant accounting policies,* in the Notes to Consolidated Financial Statements for a description of recent accounting pronouncements applicable to our business.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Interest Rate Risks

We are exposed to market risk related to changes in interest rates. As of December 31, 2023, we had cash, cash equivalents and marketable securities of $209.1 million. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates, particularly because our investments, including cash equivalents and marketable securities are invested in U.S. Treasury obligations, commercial paper, corporate bonds and U.S. government agency securities. However, we believe that due to the short-term duration of our investment portfolio and low-risk profile of our investments, an immediate 100 basis points change in the prime rate would not have a material effect on the fair market value of our investments portfolio.

The interest rate on our New Credit Facility is sensitive to changes in interest rates. Interest accrues on borrowings under the credit facility at a floating rate equal to the greater of (i) 8.50% and (ii) the prime rate plus 5.25%. We do not currently engage in any hedging activities against changes in interest rates. As of December 31, 2023, there was $25.0 million outstanding under the New Credit Facility, and a potential change in the associated interest rates would be immaterial to the results of our operations.

Foreign Currency Exchange Rate Risks

As of December 31, 2023, we were not exposed to market risk related to changes in foreign currency exchange rates, but we may contract with vendors that are located in Asia and Europe and may be subject to fluctuations in foreign currency rates at that time.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Mersana Therapeutics, Inc.

Index to Consolidated Financial Statements

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of Mersana Therapeutics, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Mersana Therapeutics, Inc. (the Company) as of December 31, 2023 and 2022, the related consolidated statements of operations and comprehensive loss, consolidated statement of stockholders' equity, and consolidated statement of cash flows for each of the three years in the period ended December 31, 2023, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2023 and 2022, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2023, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

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

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion.

Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

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

Accrued & Prepaid Clinical Expenses

Description of the Matter

As summarized in Note 7 to the consolidated financial statements, the Company's accrual for clinical expenses totaled $5.1 million as of December 31, 2023. In addition, the Company's Prepaid Expenses and Other Current Assets totaled $5.0 million, which included amounts that were paid in advance of services pursuant to clinical trials as of December 31, 2023. As discussed in Note 2 to the consolidated financial statements, the Company is required to estimate clinical costs incurred and related accruals or remaining prepaid expenses based on certain information, including actual costs incurred or level of effort expended, as provided by its vendors. Payments for such activities are based on the terms of the individual arrangements, which may differ from the pattern of costs incurred.

Auditing the Company's accrued and prepaid clinical expenses was complex and judgmental, as the amounts are based on various estimates from third-party vendors, as well as other inputs estimated by members of management, such as, actual costs incurred but not yet billed, estimated project timelines, and the costs associated with these services. Furthermore, due to the duration of the Company's research and development activities and the timing of invoicing received from third parties, the actual amounts incurred are not typically known by the date the financial statements are issued.

How We Addressed the Matter in Our Audit

To test the accrued and prepaid clinical expenses, our audit procedures included, among others, testing the accuracy and completeness of the underlying data used to estimate the amounts recorded. We corroborated the progress of research and development activities through discussion with the Company's research and development personnel that oversee the research and development projects. We also inspected the Company's contracts with third parties and any pending change orders to assess the impact on amounts recorded. Additionally, we independently confirmed and/or reviewed information received by the Company directly from certain sites and other third parties, which included third parties' estimates of costs incurred to date. We also performed analytical procedures over fluctuations in accrued and prepaid clinical expenses by vendor, study, or other significant work order and inspected subsequent invoices received from third parties to assess the impact to the accrued and prepaid balances.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2013.
Boston, Massachusetts
February 28, 2024

Mersana Therapeutics, Inc.

Consolidated Balance Sheets

(in thousands, except share and per share data)

	December 31, 2023	December 31, 2022
Assets		
Current assets:		
Cash and cash equivalents	$ 174,561	$ 128,885
Short-term marketable securities	34,523	151,827
Accounts receivable	—	30,000
Prepaid expenses and other current assets	4,973	8,507
Total current assets	214,057	319,219
Property and equipment, net	3,831	3,985
Operating lease right-of-use assets	7,694	10,475
Other assets, noncurrent	478	661
Total assets	$ 226,060	$ 334,340
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$ 7,319	$ 13,951
Accrued expenses	21,898	43,184
Deferred revenue	28,147	30,610
Operating lease liabilities	3,252	2,798
Short-term debt	2,083	—
Other current liabilities	938	990
Total current liabilities	63,637	91,533
Operating lease liabilities, noncurrent	5,149	8,575
Long-term debt, net	23,148	24,929
Deferred revenue, noncurrent	97,167	117,043
Other liabilities, noncurrent	55	203
Total liabilities	189,156	242,283
Commitments (Note 15)		
Stockholders' equity		
Preferred stock, $0.0001 par value; 25,000,000 shares authorized; 0 shares issued and outstanding at December 31, 2023 and December 31, 2022, respectively	—	—
Common stock, $0.0001 par value; 350,000,000 shares authorized; 120,711,745 and 105,144,864 shares issued and outstanding at December 31, 2023 and December 31, 2022, respectively	12	11
Additional paid-in capital	863,242	746,889
Accumulated other comprehensive income (loss)	11	(152)
Accumulated deficit	(826,361)	(654,691)
Total stockholders' equity	36,904	92,057
Total liabilities and stockholders' equity	$ 226,060	$ 334,340

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

Mersana Therapeutics, Inc.

Consolidated Statements of Operations and Comprehensive Loss

(in thousands, except share and per share data)

	Year ended December 31,		
	2023	2022	2021
Collaboration revenue	$ 36,855	$ 26,581	$ 43
Operating expenses:			
Research and development	148,269	173,385	132,013
General and administrative	59,543	56,963	36,888
Restructuring expenses	8,713	—	—
Total operating expenses	216,525	230,348	168,901
Other income (expense):			
Interest income	12,073	2,883	65
Interest expense	(4,073)	(3,328)	(1,267)
Total other income (expense), net	8,000	(445)	(1,202)
Net loss	$ (171,670)	$ (204,212)	$ (170,060)
Other comprehensive loss:			
Unrealized gain (loss) on marketable securities	163	(152)	—
Comprehensive loss	$ (171,507)	$ (204,364)	$ (170,060)
Net loss attributable to common stockholders — basic and diluted	$ (171,670)	$ (204,212)	$ (170,060)
Net loss per share attributable to common stockholders — basic and diluted	$ (1.48)	$ (2.18)	$ (2.41)
Weighted-average number of shares of common stock used in net loss per share attributable to common stockholders — basic and diluted	116,112,891	93,654,243	70,580,949

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

Mersana Therapeutics, Inc.

Consolidated Statements of Stockholders' Equity

(in thousands, except share and per share data)

	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2020	68,841,288	$ 7	$ 508,499	$ —	$ (280,419)	$ 228,087
Issuance of common stock from at-the-market transactions, net of issuance costs of $988	3,961,074	—	43,087	—	—	43,087
Exercise of stock options	421,381	—	1,837	—	—	1,837
Vesting of restricted stock units, net of employee tax obligation	407,060	—	(259)	—	—	(259)
Purchase of common stock under ESPP	78,253	—	640	—	—	640
Stock-based compensation expense	—	—	18,409	—	—	18,409
Net loss	—	—	—	—	(170,060)	(170,060)
Balance at December 31, 2021	73,709,056	$ 7	$ 572,213	$ —	$ (450,479)	$ 121,741
Issuance of common stock from at-the-market transactions, net of issuance costs of $3,476	30,497,875	4	150,758	—	—	150,762
Exercise of stock options	414,914	—	1,331	—	—	1,331
Exercise of common stock warrant	16,654	—	—	—	—	—
Vesting of restricted stock units	235,591	—	—	—	—	—
Purchase of common stock under ESPP	270,774	—	1,065	—	—	1,065
Stock-based compensation expense	—	—	21,522	—	—	21,522
Other comprehensive loss	—	—	—	(152)	—	(152)
Net loss	—	—	—	—	(204,212)	(204,212)
Balance at December 31, 2022	105,144,864	$ 11	$ 746,889	$ (152)	$ (654,691)	$ 92,057
Issuance of common stock from at-the-market transactions, net of issuance costs of $2,082	14,464,531	1	93,669	—	—	93,670
Exercise of stock options	102,596	—	427	—	—	427
Vesting of restricted stock units and other stock awards	618,246	—	—	—	—	—
Purchase of common stock under ESPP	381,508	—	1,121	—	—	1,121
Stock-based compensation expense	—	—	21,136	—	—	21,136
Other comprehensive income	—	—	—	163	—	163
Net loss	—	—	—	—	(171,670)	(171,670)
Balance at December 31, 2023	120,711,745	$ 12	$ 863,242	$ 11	$ (826,361)	$ 36,904

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

Mersana Therapeutics, Inc.

Consolidated Statements of Cash Flows

(in thousands)

	Year ended December 31,		
	2023	**2022**	**2021**
Cash flows from operating activities			
Net loss	$ (171,670)	$ (204,212)	$ (170,060)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation	1,517	927	855
Net amortization of premiums and discounts on marketable securities	(4,569)	(1,462)	—
Stock-based compensation	21,136	21,522	18,409
Non-cash operating lease expense	2,780	2,777	1,829
Other non-cash items	687	763	723
Changes in operating assets and liabilities:			
Accounts receivable	30,000	(30,000)	—
Prepaid expenses and other current assets	3,534	3,863	(2,734)
Other assets	—	—	(718)
Accounts payable	(6,080)	947	483
Accrued expenses	(20,935)	13,594	12,570
Operating lease liabilities	(3,143)	(2,539)	(1,827)
Deferred revenue	(22,139)	143,709	(43)
Other liabilities	—	748	525
Net cash used in operating activities	(168,882)	(49,363)	(139,988)
Cash flows from investing activities			
Maturities of marketable securities	277,970	97,000	—
Purchase of marketable securities	(155,919)	(247,519)	—
Purchase of property and equipment	(2,168)	(2,197)	(648)
Net cash provided by (used in) investing activities	119,883	(152,716)	(648)
Cash flows from financing activities			
Net proceeds from at-the-market facilities	93,539	150,893	43,087
Proceeds from exercise of stock options	427	1,331	1,837
Proceeds from purchases of common stock under ESPP	1,121	1,065	640
Payment of employee tax obligations related to vesting of restricted stock units	—	—	(259)
Proceeds from issuance of debt, net of issuance costs	(150)	—	24,042
Repayment of debt	—	—	(5,486)
Payments under finance lease obligations	(262)	(272)	(215)
Net cash provided by financing activities	94,675	153,017	63,646
Increase (decrease) in cash, cash equivalents and restricted cash	45,676	(49,062)	(76,990)
Cash, cash equivalents and restricted cash, beginning of period	129,363	178,425	255,415
Cash, cash equivalents and restricted cash, end of period	$ 175,039	$ 129,363	$ 178,425
Supplemental disclosures of non-cash activities:			
Purchases of property and equipment in accounts payable and accrued expenses	$ 132	$ 753	$ —
Debt financing costs in accrued expenses	$ —	$ 150	$ —
Common stock issuance costs in accounts payable and accrued expenses	$ —	$ 131	$ —
Cash paid for interest	$ 3,380	$ 2,463	$ 429
Right-of-use assets obtained in exchange for operating lease liabilities	$ —	$ 298	$ 3,783
Right-of-use assets obtained in exchange for financing lease liabilities	$ —	$ —	$ 609

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

1. Nature of business and basis of presentation

Mersana Therapeutics, Inc. is a clinical-stage biopharmaceutical company focused on developing antibody-drug conjugates ("ADCs") that offer a clinically meaningful benefit for cancer patients with significant unmet need. The Company's next-generation ADC platforms include Dolasynthen, which delivers a proprietary auristatin payload, and Immunosynthen, which delivers a proprietary stimulator of interferon genes ("STING") agonist payload.

The Company is investigating XMT-1660, a B7-H4-directed Dolasynthen ADC, in a Phase 1 clinical trial enrolling patients with solid tumors, including in breast, endometrial and ovarian cancers. The Company initiated a Phase 1 clinical trial to investigate XMT-2056, an Immunosynthen STING-agonist ADC that is designed to target a novel epitope of human epidermal growth factor receptor 2 ("HER2"), in January 2023, enrolling previously treated patients with advanced/recurrent solid tumors expressing HER2, including breast, gastric, colorectal and non-small cell lung cancers. In March 2023, following a voluntary suspension of this clinical trial by the Company, this clinical trial was placed on clinical hold by the U.S. Food and Drug Administration ("FDA"), and the FDA lifted this clinical hold in October 2023. The Company also has two additional earlier stage preclinical candidates, XMT-2068 and XMT-2175, that leverage the Company's Immunosynthen platform.

In July 2023, the Company announced top-line data from its Phase 2 UPLIFT clinical trial of upifitamab rilsodotin ("UpRi"), which did not meet its primary endpoint. In connection with this announcement, on July 27, 2023, the Company further announced that its primary focus moving forward would be on advancing product candidates and collaborations utilizing its next-generation ADC platforms, Dolasynthen and Immunosynthen. As a result, the Company wound down its UpRi-related development activities and its regulatory and commercial readiness efforts and terminated its UPGRADE-A and Phase 3 UP-NEXT clinical trials of UpRi, on which the FDA had placed a partial clinical hold in June 2023.

The Company is subject to risks common to companies in the biotechnology industry including, but not limited to, the need for additional capital, risks of failure of preclinical studies and clinical trials, the need to obtain marketing approval and reimbursement for any drug product candidate that it may identify and develop, the need to successfully commercialize and gain market acceptance of its product candidates, dependence on key personnel, protection of proprietary technology, compliance with government regulations, development of technological innovations by competitors, reliance on third party manufacturers and the ability to transition from pilot-scale production to large-scale manufacturing of products.

The Company has incurred cumulative net losses since inception. The Company's net loss was $171.7 million, $204.2 million and $170.1 million for the years ended December 31, 2023, 2022 and 2021, respectively. The Company expects to continue to incur operating losses for at least the next several years. As of December 31, 2023, the Company had an accumulated deficit of $826.4 million. The future success of the Company is dependent on, among other factors, its ability to identify and develop its product candidates and ultimately upon its ability to attain profitable operations. The Company has devoted substantially all of its financial resources and efforts to research and development and general and administrative expense to support such research and development. Net losses and negative operating cash flows have had, and will continue to have, an adverse effect on the Company's stockholders' equity and working capital.

The Company believes that its currently available funds will be sufficient to fund the Company's operations through at least the next twelve months from the issuance of this Annual Report on Form 10-K. Management's belief with respect to its ability to fund operations is based on estimates that are subject to risks and uncertainties. If actual results are different from management's estimates, the Company may need to seek additional funding.

The accompanying consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States ("U.S. GAAP") and the rules and regulations of the Securities and Exchange Commission ("SEC"). Any reference in these notes to applicable guidance is meant to refer to the authoritative U.S. GAAP as found in the Accounting Standards Codification ("ASC") and Accounting Standards Updates ("ASU") of the Financial Accounting Standards Board ("FASB").

2. Summary of significant accounting policies

Principles of Consolidation

The accompanying consolidated financial statements include those of the Company and its wholly owned subsidiary, Mersana Securities Corp. All intercompany balances and transactions have been eliminated.

Use of Estimates

The preparation of the Company's consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, equity, revenue, expenses and related disclosure of contingent assets and liabilities at the date of the financial statements and reported amounts of revenue and expenses during the reporting period. On an ongoing basis, the Company's management evaluates its estimates which include, but are not limited to, management's judgments with respect to the identification of performance obligations and standalone selling prices of those performance obligations within its revenue arrangements, accrued preclinical, manufacturing and clinical expenses, valuation of stock-based awards and income taxes. Actual results could differ from those estimates.

Segment Information

Operating segments are defined as components of an enterprise about which separate discrete information is available for evaluation by the chief operating decision-maker, or decision making group, in deciding how to allocate resources and assess performance. The Company views its operations and manages its business as a single operating segment, which is the business of discovering and developing ADCs.

Research and Development

Research and development costs are expensed as incurred and include:

- employee-related expenses, including salaries, bonuses, benefits, travel and stock-based compensation expense;
- fees and expenses incurred under agreements with contract research organizations, investigative sites and other entities in connection with the conduct of preclinical studies, clinical trials and related services;
- the cost of acquiring, developing and manufacturing ADC product candidates, clinical trial materials and other research and development materials;
- fees and costs related to regulatory filings and activities;
- costs associated with collaboration agreements and license fees and milestone payments related to license agreements;
- costs associated with developing a NaPi2b diagnostic biomarker;
- facilities, depreciation and other expenses, which include direct and allocated expenses for rent, utilities, maintenance of facilities, insurance and other supplies; and
- other costs associated with clinical, preclinical, discovery and other research activities.

Costs for certain development activities, such as preclinical studies, clinical trials and manufacturing development activities, are recognized based on an evaluation of the progress to completion of specific tasks using data such as patient enrollment, clinical site activations, and information provided to the Company by its vendors on their actual costs incurred or level of effort expended. Payments for these activities are based on the terms of the individual arrangements, which may differ from the pattern of costs incurred, and are reflected on the consolidated balance sheets as prepaid or accrued preclinical, manufacturing and clinical expenses.

Revenue Recognition

The Company enters into collaboration agreements which are within the scope of ASC 606, *Revenue from Contracts with Customers* ("ASC 606"), under which the Company licenses rights to its technology and certain of the Company's product candidates and performs research and development services for third parties. The terms of these arrangements typically include payment of one or more of the following: non-refundable, up-front fees; reimbursement of research and development costs; development, regulatory and commercial milestone payments; and royalties on net sales of licensed products.

Under ASC 606, an entity recognizes revenue when its customer obtains control of promised goods or services, in an amount that reflects the consideration which the entity expects to receive in exchange for those goods or services. To determine the appropriate amount of revenue to be recognized for arrangements determined to be within the scope of ASC 606, the Company performs the following five steps: (i) identification of contract(s) with a customer; (ii) determination of whether the promised goods or services are performance obligations; (iii) measurement of the transaction price, including the constraint on variable consideration; (iv) allocation of the transaction price to the performance obligations; and (v) recognition of revenue when (or as) the Company satisfies each performance obligation. The Company only applies the five-step model to contracts when it is probable that the entity will collect consideration to which it is entitled in exchange for the goods or services it transfers to the customer.

The promised good or services in the Company's arrangements typically consist of license rights to the Company's intellectual property and research and development services. The Company also has optional additional items in contracts, which are considered marketing offers and are accounted for as separate contracts with the customer if such option is elected by the customer, unless the option provides a material right which would not be provided without entering into the contract. Performance obligations are promised goods or services in a contract to transfer a distinct good or service to the customer. Promised goods or services are considered distinct when (i) the customer can benefit from the good or service on its own or together with other readily available resources or (ii) the promised good or service is separately identifiable from other promises in the contract. In assessing whether promised goods or services are distinct, the Company considers factors such as the stage of development of the underlying intellectual property, the capabilities of the customer to develop the intellectual property on their own and the availability of the required expertise.

The Company estimates the transaction price based on the amount expected to be received for transferring the promised goods or services in the contract. The consideration may include both fixed consideration and variable consideration. At the inception of each arrangement that includes variable consideration and at each reporting period, the Company evaluates the amount of potential payment and the likelihood that the payments will be received. The Company utilizes either the most likely amount method or expected value method to estimate the amount expected to be received based on which method better predicts the amount of consideration to which the Company will be entitled. If it is probable that a significant revenue reversal would not occur, the variable consideration is included in the transaction price. The Company assessed each of its revenue generating arrangements in order to determine whether a significant financing component exists and concluded that a significant financing component does not exist in any of its arrangements because: (a) the promised consideration approximates the cash selling price of the promised goods and services; and (b) timing of payment approximates the transfer of goods and services and performance is over a relatively short period of time within the context of the entire term of the contract.

The Company's contracts often include development and regulatory milestone payments. At contract inception and at each reporting period, the Company evaluates whether the milestones are considered probable of being reached and estimates the amount to be included in the transaction price using the most likely amount method. If it is probable that a significant revenue reversal would not occur, the associated milestone value is included in the transaction price. Milestone payments that are not within the Company's control or the licensee's control, such as regulatory approvals, are not included in the transaction price. At the end of each subsequent reporting period, the Company re-evaluates the probability of achievement of such development milestones and any related constraint, and if necessary, adjusts its estimate of the overall transaction price. Any such adjustments are recorded on a cumulative catch-up basis, which would affect license, collaboration and other revenues and earnings in the period of adjustment.

For arrangements that include sales-based royalties, including milestone payments based on the level of sales, and the license is deemed to be the predominant item to which the royalties relate, the Company recognizes revenue at the later of (i) when the related sales occur, or (ii) when the performance obligation to which some or all of the royalty has been allocated has been satisfied (or partially satisfied). To date, the Company has not recognized any royalty revenue resulting from any of the Company's collaboration arrangements.

The Company allocates the transaction price based on the estimated standalone selling price of the underlying performance obligations or in the case of certain variable consideration to one or more performance obligations. The Company must develop assumptions that require judgment to determine the standalone selling price for each performance obligation identified in the contract. The Company utilizes key assumptions to determine the standalone selling price, which may include other comparable transactions, pricing considered in negotiating the transaction and the estimated costs to complete the respective performance obligation. Certain variable consideration is allocated specifically to one or more performance obligations in a contract when the terms of the variable consideration relate to the satisfaction of the performance obligation and the resulting amounts allocated to each performance obligation are consistent with the amounts the Company would expect to receive for each performance obligation.

For performance obligations consisting of licenses and other promises, the Company utilizes judgment to assess the nature of the combined performance obligation to determine whether the combined performance obligation is satisfied over time or at a point in time and, if over time, the appropriate method of measuring progress for purposes of recognizing revenue from non-refundable, up-front fees. The Company evaluates the measure of progress each reporting period and, if necessary, adjusts the measure of performance and related revenue recognition. If the license to the Company's intellectual property is determined to be distinct from the other performance obligations identified in the arrangement, the Company will recognize revenue from non-refundable, up-front fees allocated to the license when the license is transferred to the customer and the customer is able to use and benefit from the license.

The Company receives payments from its customers based on billing schedules established in each contract. Such billings generally have 30-day terms. Up-front payments and fees are recorded as a contract liability (deferred revenue) upon receipt or when due until the Company performs its obligations under these arrangements. Amounts are recorded as accounts receivable when the right to consideration is unconditional and only the passage of time is required before payment is due. If the right to consideration is subject to a condition other than the passage of time, then the amount is recorded as a contract asset until the right to payment becomes unconditional. In accordance with ASC 606, the Company presents contract assets and contract liabilities on a net basis by customer contract.

Collaborative Arrangements

The Company records the elements of its collaboration agreements that represent joint operating activities in accordance with ASC 808, *Collaborative Arrangements* ("ASC 808"). Accordingly, the elements of the collaboration agreements that represent activities in which both parties are active participants and to which both parties are exposed to the significant risks and rewards that are dependent on the commercial success of the activities, are recorded as collaborative arrangements. The Company also considers the guidance in ASC 606 by analogy in determining the appropriate treatment for the transactions between the Company and its collaborators and the transactions between the Company and third parties. Generally, the classification of transactions under the collaborative arrangements is determined based on the nature and contractual terms of the arrangement along with the nature of the operations of the participants. To the extent revenue is generated from a collaboration, the Company will recognize its share of the net sales on a gross basis if it is deemed to be the principal in the transactions with customers, or on a net basis if it is instead deemed to be the agent in the transactions with customers, consistent with the guidance in ASC 606.

Fair Value Measurements

Fair value is defined as the price that would be received upon sale of an asset or paid to transfer a liability between market participants at measurement dates. ASC 820, *Fair Value Measurement*, establishes a three-level valuation hierarchy for instruments measured at fair value. The hierarchy is based on the transparency of inputs to the valuation of an asset or liability as of the measurement date. The three levels are defined as follows:

Level 1—Inputs to the valuation methodology are quoted prices (unadjusted) for identical assets or liabilities in active markets.

Level 2—Inputs to the valuation methodology include quoted prices for similar assets and liabilities in active markets, and inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the financial instrument.

Level 3—Inputs to the valuation methodology are unobservable and significant to the fair value measurement.

Marketable Securities

The Company's investment strategy is focused on capital preservation. The Company invests in instruments that meet the credit quality standards outlined in the Company's investment policy. Short-term marketable securities consist of investments in debt securities with maturities greater than three months and less than one year from the balance sheet date. The Company classifies all of its marketable securities as available-for-sale. Accordingly, these investments are recorded at fair value. Fair value is determined based on quoted market prices. Amortization and accretion of discounts and premiums are recorded as interest income within other income (expense), net. Realized gains and losses are included in other income (expense), net.

The Company assesses its available-for-sale debt securities under the available-for-sale debt security impairment model in ASC 326, *Financial Instruments - Credit Losses*, as of each reporting date in order to determine if a portion of any decline in fair value below carrying value recognized on its available-for-sale debt securities is the result of a credit loss. The Company records credit losses in the consolidated statements of operations and comprehensive loss as a component of other income (expense), net, which is limited to the difference between the fair value and the amortized cost of the security. To date, the Company has not recorded any credit losses on its available-for-sale debt securities.

Cash and Cash Equivalents

The Company considers all highly liquid investments with an original maturity, or a remaining maturity at the time of purchase, of three months or less to be cash equivalents. The Company invests excess cash primarily in money market funds, commercial paper and government agency securities, which are highly liquid and have strong credit ratings. These investments are subject to minimal credit and market risks. Cash and cash equivalents are stated at cost, which approximates market value.

Accounting for Stock-based Compensation

The Company accounts for its stock-based compensation in accordance with ASC 718, *Compensation—Stock Compensation* ("ASC 718"). ASC 718 requires all stock-based payments to employees, directors and non-employees to be recognized as expense in the statements of operations based on their grant date fair values. The Company estimates the fair value of options granted using the Black-Scholes option pricing model. The Black-Scholes option pricing model requires inputs based on certain subjective assumptions, including (a) the expected stock price volatility, (b) the calculation of expected term of the award, (c) the risk-free interest rate and (d) expected dividends. The expected stock price volatility is calculated based on a period of time commensurate with the expected term assumption. Historically, due to the lack of a public market for the Company's common stock prior to completion of its initial public offering and a lack of company-specific historical and implied volatility data, the Company based its estimate of expected volatility on the historical volatility of a group of similar companies that are publicly traded. The computation of expected volatility was based on the historical volatility of a representative group of companies with similar characteristics to the Company, including stage of product development and life science industry focus. During 2022, the Company began to estimate its volatility by using a blend of its stock price history for the length of time it has market data for its stock and the historical volatility of similar public companies for the expected term of each grant. During 2023, the Company began to estimate its volatility solely using its stock price history. The Company uses the simplified method as prescribed by the SEC Staff Accounting Bulletin No. 107, *Share-Based Payment*, to calculate the expected term for options granted to employees as it does not have sufficient historical exercise data to provide a reasonable basis upon which to estimate the expected term. For option grants with an expected term for which sufficient stock price history for the Company exists, expected stock price volatility is calculated using the average of volatilities for the period of the expected term prior to the grant date. For options granted to non-employees, the Company utilizes the contractual term of the option arrangement as the basis for the expected term assumption. The risk-free interest rate is based on a treasury instrument whose term is consistent with the expected term of the stock options. The expected dividend yield is assumed to be zero as the Company has never paid dividends and has no current plans to do so.

The Company determines the fair value of each restricted stock unit ("RSU") at its grant date based on the closing market price of the Company’s common stock on that date or, if the date of grant is not a day on which the Company's primary trading market was open, the immediately preceding trading day. For stock-based compensation subject to service-based vesting conditions, the Company recognizes stock-based compensation expense equal to the grant date fair value of stock-based compensation on a straight-line basis over the requisite service period.

The Company records forfeitures as a cumulative adjustment in the period in which they occur.

Property and Equipment

Property and equipment is stated at cost, less accumulated depreciation. Depreciation is computed using the straight-line method over the estimated useful life of each asset as follows:

Computer equipment, office equipment and software	3 years
Laboratory equipment	5 years
Leasehold improvements	Shorter of useful life or life of lease

Upon retirement or sale, the cost of the disposed assets and the related accumulated depreciation are eliminated from the balance sheet, and related gains or losses are reflected in the statements of operations and comprehensive loss. There were no material sales of assets during the years ended December 31, 2023, 2022 and 2021.

The Company reviews its long-lived assets for impairment whenever events or changes in business circumstances indicate that the carrying amount of the assets may not be fully recoverable. If the Company performs an impairment review to evaluate an asset for recoverability, the Company compares forecasts of undiscounted cash flows expected to result from the use and eventual disposition of the asset to its carrying value. If the carrying amount of the asset exceeds its estimated undiscounted future net cash flows, the Company recognizes an impairment charge in the amount by which the carrying amount of the asset exceeds the fair value of the asset. The Company did not recognize impairment charges during the years ended December 31, 2023, 2022 and 2021.

Leases

Consistent with ASC 842, *Leases*, the Company determines if an arrangement is a lease at inception. Operating leases are included in right-of-use lease assets ("ROU assets"), current portion of lease obligations and long-term lease obligations on the Company's consolidated balance sheets. Assets subject to finance leases are included in property and equipment, and the related lease obligation is included in other current liabilities and other long-term liabilities on the Company's consolidated balance sheets. Lease assets are tested for impairment in the same manner as long-lived assets used in operations. Lease expense for operating leases is recognized on a straight-line basis over the lease term as an operating expense while expense for financing leases is recognized as depreciation expense and interest expense using the effective interest method. The Company has elected the short-term lease recognition exemption for short-term leases, which allows the Company not to recognize lease liabilities and ROU assets on the consolidated balance sheets for leases with an original term of twelve months or less.

ROU assets represent the Company's right to use an underlying asset for the lease term, and lease obligations represent the Company's obligation to make lease payments arising from the lease. Operating lease liabilities and their corresponding ROU assets are initially recorded based on the present value of lease payments over the expected remaining lease term. When determining the lease term, the Company includes options to extend or terminate the lease when it is reasonably certain that the option will be exercised. Certain adjustments to the ROU asset may be required for items such as incentives received. The interest rate implicit in lease contracts is typically not readily determinable. As a result, the Company utilizes its incremental borrowing rate to discount lease payments. The incremental borrowing rate reflects the fixed rate at which the Company could borrow, on a collateralized basis, the amount of the lease payments in the same currency, for a similar term, in a similar economic environment.

The Company accounts for lease agreements with lease and non-lease components separately.

Patent Costs

The Company expenses patent application and related legal costs as incurred and classifies such costs as general and administrative expenses in the accompanying consolidated statements of operations and comprehensive loss.

Income Taxes

The Company accounts for income taxes in accordance with ASC 740, *Accounting for Income Taxes* ("ASC 740"), which provides for deferred taxes using an asset and liability approach. The Company recognizes deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements or tax returns. The Company determines its deferred tax assets and liabilities based on differences between financial reporting and tax bases of assets and liabilities, which are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. Valuation allowances are provided if, based upon the weight of available evidence, it is more likely than not that some or all of the deferred tax assets will not be realized.

The Company recognizes the effect of income tax positions only if those positions are more likely than not to be sustained. Recognized income tax positions are measured at the largest amount that is more likely than not to be realized. Changes in recognition or measurement are reflected in the period in which the change in judgment occurs.

Comprehensive Income (Loss)

Comprehensive income (loss) comprises net loss and other comprehensive loss. For the years ended December 31, 2023 and 2022, other comprehensive income (loss) consisted of changes in unrealized income and loss on marketable securities. For the year ended December 31, 2021, comprehensive loss equaled net loss.

Concentration of Credit Risk and Off-balance Sheet Risk

Financial instruments that potentially subject the Company to concentrations of credit risk primarily consist of cash equivalents and marketable securities. Under its investment policy, the Company limits amounts invested in such securities by credit rating, maturity, industry group, investment type and issuer, except for securities issued by the U.S. government. The Company does not believe that it is subject to any significant concentrations of credit risk from these financial instruments. The Company has no financial instruments with off-balance sheet risk, such as foreign exchange contracts, option contracts, or other foreign hedging arrangements.

Recently Issued Accounting Pronouncements

From time to time, new accounting pronouncements are issued by the FASB or other standard-setting bodies, and the Company adopts such pronouncements as of the specified effective date. Unless otherwise discussed below, the Company does not believe that the adoption of recently issued standards has had or may have a material impact on the Company's consolidated financial statements or disclosures.

In November 2023, the FASB issued Accounting Standard Update 2023-07, *Segment Reporting (Topic 280): Improvements to Reportable Segment Disclosures*, which is intended to improve reportable segment disclosure requirements, primarily through additional disclosures about significant segment expenses. The standard is effective for fiscal years beginning after December 15, 2023, and interim periods within fiscal years beginning after December 15, 2024, with early adoption permitted. The amendments should be applied retrospectively to all prior periods presented in the financial statements. The Company is currently evaluating the disclosure requirements related to the new standard.

In December 2023, the FASB, issued Accounting Standard Update 2023-09, *Improvements to Income Tax Disclosures*, which requires entities to disclose disaggregated information about their effective tax rate reconciliation as well as expanded information on income taxes paid by jurisdiction. The disclosure requirements will be applied on a prospective basis, with the option to apply them retrospectively. The standard is effective for fiscal years beginning after December 15, 2024, with early adoption permitted. The Company is currently evaluating the disclosure requirements related to the new standard.

3. Collaboration agreements

GSK

On August 6, 2022, the Company entered into a Collaboration, Option and License Agreement (the "GSK Agreement") with GlaxoSmithKline Intellectual Property (No. 4) Limited ("GSK"), pursuant to which the Company granted GSK an exclusive option to obtain an exclusive license (the "Option") to co-develop and to commercialize products containing XMT-2056 (the "Licensed Products"), exercisable within a specified time period (the "Option Period") after the Company delivers to GSK data resulting from completion of dose escalation with enrichment for breast cancer patients in a Phase 1 single-agent clinical trial of XMT-2056. GSK's exercise of the Option may require clearance under the Hart-Scott-Rodino Antitrust Improvements Act of 1976 ("HSR Clearance" and GSK's exercise of the Option following any applicable HSR Clearance, the "GSK Option Exercise"). Prior to the GSK Option Exercise, the Company will lead and will be responsible for the costs of manufacturing, research, and early clinical development related to its XMT-2056 program. After the GSK Option Exercise, if any, GSK has the right to elect to manufacture XMT-2056, and GSK and the Company will co-develop XMT-2056 aimed at the approval of Licensed Product(s) in the United States and the European Union, with GSK being responsible for the majority of the development costs. GSK will be responsible for all development costs aimed solely at gaining approval outside the United States and European Union.

Pursuant to the GSK Agreement, following the GSK Option Exercise and subject to certain exceptions and specified payment obligations, the Company's aggregate shared development costs are capped at a fixed amount, with any amounts in excess to be borne by GSK unless and until the Company exercises its option to receive (or bear) a specified share of U.S. profits (or losses) for any Licensed Products ("Profit Share Election"). The excess development costs will accrue interest as specified in the GSK Agreement and will later either be repaid by the Company or offset against future regulatory and sales milestones or royalty payments that may become due to the Company. If the Company exercises its Profit Share Election, the cap on the Company's share of development costs shall no longer apply, and the Company must pay any then-outstanding excess plus accrued interest costs. Additionally, if the Company exercises its Profit Share Election, it may also simultaneously elect to co-promote any Licensed Products in the United States.

Pursuant to the GSK Agreement, GSK paid the Company a non-refundable, upfront fee of $100.0 million in August 2022. Following the GSK Option Exercise, if any, GSK is obligated to pay the Company an option exercise payment of $90.0 million (the "Option Payment"). The Company is eligible to receive future development, regulatory, and commercial milestone payments up to approximately $1.3 billion and, if the Company does not exercise its Profit Share Election, tiered royalties up to the mid-twenty percent range based on global sales of Licensed Products. Included in the aggregate milestone payments amount is $30 million that the Company is eligible to earn upon the satisfaction of early clinical development milestones that may occur prior to the GSK Option Exercise. If the Company exercises its Profit Share Election, the Company will be eligible to receive reduced development, regulatory, and commercial milestone payments and reduced royalty rates on sales outside of the United States. Whether or not the Company exercises its Profit Share Election, GSK will be responsible for certain milestone payments or royalties due to specified third parties with which the Company currently has agreements that relate to the XMT-2056 program.

The GSK Agreement will terminate at the end of the Option Period if GSK does not exercise its Option. In the event of the GSK Option Exercise, unless earlier terminated, the GSK Agreement will continue in effect until the date on which the royalty term and all payment obligations with respect to all Licensed Products in all countries have expired.

Accounting Analysis

The Company assessed the GSK Agreement in accordance with ASC 606 and concluded that the contract counterparty, GSK, is a customer. The Company identified the following two material performance obligations under the GSK Agreement: (i) development activities, including manufacturing, research and early clinical development activities, necessary to deliver the package of data, information and materials specified in the GSK agreement (the "Development Activities") and (ii) the Option to co-develop and to commercialize Licensed Products (the "License Option").

The Company concluded that the Development Activities are one distinct performance obligation, as the underlying activities are not distinguishable in the context of the contract and are inputs to an integrated development program that will generate data and information providing value to GSK in determining whether to exercise the Option. The License Option is considered a material right as the value of the license exceeds the Option Payment, and is therefore a distinct performance obligation.

In accordance with ASC 606, the Company determined that the initial transaction price under the GSK Agreement equals $100.0 million, consisting of the upfront, non-refundable and non-creditable payment paid by GSK. None of the early clinical development milestones that may occur prior to the GSK Option Exercise have been included in the initial transaction price, as all milestone amounts were fully constrained. As part of its evaluation of the constraint, the Company considered numerous factors, including stage of development and the remaining risks associated with the development required to achieve the milestones, as well as whether the achievement of the milestones is outside the control of the Company or GSK. The GSK Option payment is excluded from the initial transaction price at contract inception along with any future development, regulatory, and commercial milestone payments (including royalties) following the GSK Option Exercise.

Consistent with the allocation objective under ASC 606, the Company allocated the $100.0 million fixed upfront payment in the transaction price to the Development Activities and the License Option based on each performance obligation's relative standalone selling price. The standalone selling price for the Development Activities was calculated using a cost-plus margin approach for the estimated pre-option development timeline. For the standalone selling price of the License Option, the Company utilized an income-based approach which included the following key assumptions: post-option development timeline and costs, revenue forecast, discount rates and probabilities of technical and regulatory success.

The Company is recognizing revenue related to the Development Activities performance obligation over the estimated period of the pre-option development using a proportional performance model as the underlying activities are performed. The Company measures proportional performance based on the costs incurred relative to the total costs expected to be incurred.

The Company deferred revenue recognition related to the License Option. If the License Option is exercised and GSK obtains an exclusive license, the Company will recognize revenue as it fulfills its obligations under the GSK Agreement. If the Option is not exercised, the Company will recognize the entirety of the revenue in the period when the Option expires.

During the years ended December 31, 2023 and 2022, the Company recorded collaboration revenue of $3.4 million and $2.0 million, respectively, related to its efforts under the GSK Agreement. As of December 31, 2023 and 2022 , the Company had recorded $94.6 million and $98.0 million, respectively, in deferred revenue related to the unsatisfied performance obligations under the GSK Agreement. This deferred revenue will be recognized over the remaining performance period and classified as current or noncurrent on the consolidated balance sheets based upon the expected timing of satisfaction of the performance obligations.

Johnson & Johnson

In February 2022, the Company entered into a research collaboration and license agreement with Janssen Biotech Inc. ("Johnson & Johnson" and such agreement, as amended on July 14, 2023 and September 25, 2023, the "Johnson & Johnson Agreement") focused on the research, development and commercialization of novel ADCs for three oncology targets by leveraging Mersana's ADC expertise and Dolasynthen platform with Johnson & Johnson's proprietary antibodies. Upon execution of the Johnson & Johnson Agreement, the Company received a non-refundable upfront payment of $40.0 million from Johnson & Johnson. Pursuant to the Johnson & Johnson Agreement, the Company granted Johnson & Johnson two exclusive, nontransferable, worldwide licenses - a research license and a commercialization license (together, the "Johnson & Johnson Licenses"). The research license that forms a part of the Johnson & Johnson Licenses provides Johnson & Johnson, on a target-by-target basis, rights under the Company's technology and the Company's interest in the technology developed jointly through the collaboration solely to conduct Johnson & Johnson's activities under the research and Chemistry, Manufacturing and Controls ("CMC") plans with respect to each target. The commercialization license that forms a part of the Johnson & Johnson Licenses is a royalty-bearing license granted on a target-by-target basis under the Company's technology and the Company's interest in the technology developed jointly through the collaboration to develop, manufacture, commercialize and otherwise exploit licensed ADCs and any licensed products containing licensed ADCs directed toward a target. Johnson & Johnson may select up to three targets and may substitute each target once prior to a substitution deadline. Johnson & Johnson is not required to pay a fee for its first substitution right, but must pay a one-time fee for access to the subsequent substitution rights following its exercise of its second substitution right. During the year ended December 31, 2023, Johnson & Johnson exercised its first substitution right for a certain target.

Pursuant to mutually agreed research and CMC plans, the Company agreed to perform bioconjugation, production development, preclinical manufacturing, and certain related research and preclinical development activities, in order to progress the targets through investigational new drug application ("IND") submission for further development, manufacture and commercialization by Johnson & Johnson. Johnson & Johnson will have sole responsibility for IND-enabling studies, IND submission, clinical development, regulatory activities and commercialization of the licensed ADCs. Both the Company and Johnson & Johnson will have equal representation on a Joint Research Committee and Joint Manufacturing Committee to oversee the research and CMC activities. The Company estimates that its activities under the research plans for the targets will be performed into 2025.

Johnson & Johnson is required to pay for the Company's CMC activities at agreed upon rates. Assuming successful development and commercialization of all three targets by Johnson & Johnson, the Company is eligible to receive up to $505 million in development and regulatory milestones and $530 million in sales milestones, as well as tiered mid single-digit to low double-digit royalties on aggregate net sales of the ADC products.

Unless earlier terminated, the Johnson & Johnson Agreement will expire upon the expiration of the last royalty term for a product under the Johnson & Johnson Agreement. The Johnson & Johnson Agreement contains customary provisions for termination by either party, including in the event of breach of the Johnson & Johnson Agreement, subject to cure, by Johnson & Johnson for convenience and by the Company upon a challenge of the licensed patents, and customary provisions regarding the effects of termination.

Johnson & Johnson may request that the Company perform clinical manufacturing services under a separate clinical supply agreement. Johnson & Johnson may also request that the Company perform a technology transfer of bioconjugation and manufacturing process technology, at Johnson & Johnson's cost, at an agreed upon rate.

Accounting Analysis

The Company assessed the Johnson & Johnson Agreement in accordance with ASC 606 and concluded that the contract counter party, Johnson & Johnson, is a customer. The Company identified the following seven material performance obligations under the Johnson & Johnson Agreement: (i) exclusive Johnson & Johnson Licenses and research activities for each of the three designated targets, (ii) CMC activities for each of the three designated targets and (iii) the first target substitution right.

The Company concluded that the Johnson & Johnson Licenses and research activities are one combined performance obligation for each target as the Johnson & Johnson Licenses are not capable of being distinct from the research activities given their

proprietary nature. The CMC activities are considered a distinct performance obligation for each target as the activities could be performed by a third-party provider. The first target substitution right is considered a material right as there is no option exercise fee and, as such, is a distinct performance obligation.

In accordance with ASC 606, the Company determined that the initial transaction price under the Johnson & Johnson Agreement equals $40.0 million, consisting of the upfront, non-refundable and non-creditable payment. None of the development and the regulatory milestones were included in the initial transaction price, as all milestone amounts were fully constrained. As part of its evaluation of the constraint, the Company considered numerous factors, including stage of development and the remaining risks associated with the development required to achieve the milestones, as well as whether the achievement of the milestones is outside the control of the Company or Johnson & Johnson. Any consideration related to sales-based milestones (including royalties) will be recognized when the related sales occur as such milestones were determined to relate predominantly to the license granted to Johnson & Johnson and therefore have also been excluded from the transaction price. As of December 31, 2023, the revised total transaction price for the Johnson & Johnson Agreement was $48.0 million. During 2023, the Company revised the estimated transaction price by $6.0 million based on the reassessment of the constraint of certain development milestones and the remaining risks associated with the development required to achieve the milestones.

The Company determined that the consideration for CMC activities represents variable consideration. CMC activities for one of the three designated targets have been initiated. The Company has elected to apply the Right to Invoice practical expedient under ASC 606 related to the CMC activities. As such, the Company will recognize revenue related to the CMC activities when the services are performed over the corresponding CMC plan for a given target.

Consistent with the allocation objective under ASC 606, the Company allocated the total transaction price to the Johnson & Johnson Licenses and research activities and first substitution right based on each performance obligation’s relative standalone selling price. Each of the standalone selling prices for the Johnson & Johnson Licenses and research activities and for the first substitution right were estimated utilizing an income approach, along with the likelihood of exercise for the substitution right and included the following key assumptions: the development timeline, revenue forecast, discount rate and probabilities of technical and regulatory success. Due to Johnson & Johnson's exercise of its first substitution right, the transaction price related to that performance obligation has been reallocated to the Johnson & Johnson Licenses and research activities for the three designated targets.

The Company is recognizing revenue related to the Johnson & Johnson Licenses and research services performance obligation over the estimated period of the research services using a proportional performance model. The Company measures proportional performance based on the costs incurred relative to the total costs expected to be incurred.

During the years ended December 31, 2023 and 2022, the Company recorded collaboration revenue of $16.6 million and $24.2 million, respectively, related to its performance obligations under the Johnson & Johnson Agreement. As of December 31, 2023 and 2022, the Company had recorded $10.4 million and $15.8 million, respectively, in deferred revenue related to the Johnson & Johnson Agreement that will be recognized over the remaining performance period and classified as current or noncurrent on the consolidated balance sheets based upon the expected timing of satisfaction of respective performance obligations.

Merck KGaA

Immunosynthen Platform Agreement

In December 2022, the Company entered into a research collaboration and license agreement with Ares Trading S.A., a wholly owned subsidiary of Merck KGaA, Darmstadt, Germany (Merck KGaA and/or its affiliate, as applicable, "Merck KGaA" and such agreement, the "2022 Merck KGaA Agreement"), focused on the research, development and commercialization of novel ADCs for up to two specific target antigens by leveraging Mersana's ADC expertise and Immunosynthen platform with Merck KGaA's proprietary antibodies. In connection with the 2022 Merck KGaA Agreement, the Company received a non-refundable upfront payment of $30.0 million. Pursuant to the 2022 Merck KGaA Agreement, the Company granted Merck KGaA two exclusive, non-transferable, worldwide licenses - a research license and a commercialization license (together, the "Merck KGaA Licenses"). The research license that forms a part of the Merck KGaA Licenses provides Merck KGaA, on a target-by-target basis, rights under the Company's technology and the Company's interest in the technology developed jointly through the collaboration solely to conduct Merck KGaA's activities under the research and CMC plans with respect to each target. The commercialization license that forms a part of the Merck KGaA Licenses is a royalty-bearing license granted on a target-by-target basis under the Company's technology and the Company's interest in the technology developed jointly through the collaboration to develop, manufacture, commercialize and otherwise exploit licensed ADCs and any licensed products containing licensed ADCs directed toward a target.

Pursuant to mutually agreed research and CMC plans, the Company agreed to perform bioconjugation, production development, preclinical manufacturing, and certain related research and preclinical development activities, in order to progress the targets through IND (or foreign equivalent) submission for further development, manufacture and commercialization by Merck KGaA. Merck KGaA will have sole responsibility for IND-enabling studies, IND submission, clinical development, regulatory activities and commercialization of the licensed ADCs. Both the Company and Merck KGaA will have equal representation on a Joint Research Committee and Joint Manufacturing Committee to oversee the research and CMC activities. The Company estimates that its activities under the research plans for the targets will be performed through 2026.

The Company's CMC activities will be compensated by Merck KGaA at agreed upon rates. Assuming successful development and commercialization of the two targets by Merck KGaA, the Company is eligible to receive up to $200 million in development and regulatory milestones and $600 million in sales milestones as well as tiered single-digit to low double-digit royalties on aggregate net sales of the ADC products.

Unless earlier terminated, the 2022 Merck KGaA Agreement will expire upon the expiration of the last royalty term for a product under the 2022 Merck KGaA Agreement. The 2022 Merck KGaA Agreement contains customary provisions for termination by either party, including in the event of breach of the 2022 Merck KGaA Agreement, subject to cure, by Merck KGaA for convenience and by the Company upon a challenge of the licensed patents, and customary provisions regarding the effects of termination.

Merck KGaA may request that the Company perform clinical manufacturing services under a separate clinical supply agreement. Merck KGaA may also request that the Company perform a technology transfer of bioconjugation technology, at Merck KGaA's cost, at an agreed upon rate.

Accounting Analysis

The Company assessed the 2022 Merck KGaA Agreement in accordance with ASC 606 and concluded that the contract counter party, Merck KGaA, is a customer. The Company identified the following four material performance obligations under the 2022 Merck KGaA Agreement: (i) exclusive Merck KGaA Licenses and research activities for each of the two designated targets and (ii) CMC activities for each of the two designated targets.

The Company concluded that the Merck KGaA Licenses and research activities are one combined performance obligation for each target as the Merck KGaA Licenses are not capable of being distinct from the research activities given their proprietary nature. The CMC activities are considered a distinct performance obligation for each target as the activities could be performed by a third-party provider.

In accordance with ASC 606, the Company determined that the initial transaction price under the 2022 Merck KGaA Agreement equals $32.0 million, consisting of the $30.0 million upfront, non-refundable and non-creditable fee and certain near-term discovery milestones. The $30.0 million upfront fee was not received by the Company as of December 31, 2022, and was recorded as an accounts receivable with a corresponding deferred revenue liability for the year ended December 31, 2022. The Company subsequently received this payment in February 2023. The development and the regulatory milestones not included in the transaction price were constrained. As part of its evaluation of the constraint, the Company considered numerous factors, including stage of development and the remaining risks associated with the development required to achieve the milestones, as well as whether the achievement of the milestones is outside the control of the Company or Merck KGaA. Any consideration related to sales-based milestones (including royalties) will be recognized when the related sales occur as such milestones were determined to relate predominantly to the license granted to Merck KGaA and therefore have also been excluded from the transaction price.

The Company determined that the consideration for CMC activities represents variable consideration. The Company has elected to apply the Right to Invoice practical expedient under ASC 606 related to the CMC activities. As such, the Company will recognize revenue related to the CMC activities when the services are performed over the corresponding CMC plan for a given target. CMC activities for the targets have not yet been initiated.

Consistent with the allocation objective under ASC 606, the Company allocated the $32.0 million estimated transaction price to the Merck KGaA Licenses and research activities based on each performance obligation's relative standalone selling price. Each of the standalone selling prices for the Merck KGaA Licenses and research activities were estimated utilizing an adjusted market assessment approach, which was established based on comparable transactions.

The Company is recognizing revenue related to the Merck KGaA Licenses and research services performance obligation over the estimated period of the research services using a proportional performance model. The Company measures proportional performance based on the costs incurred relative to the total costs expected to be incurred.

During the year ended December 31, 2023, the Company recorded collaboration revenue of $10.7 million related to its efforts under the 2022 Merck KGaA Agreement. The Company did not record collaboration revenue related to the 2022 Merck KGaA Agreement during the year ended December 31, 2022. As of December 31, 2023 and 2022, the Company had recorded $20.2 million and $30.0 million, respectively, in deferred revenue related to the unsatisfied performance obligations under the 2022 Merck KGaA Agreement. This deferred revenue will be recognized over the remaining performance period and classified as current or noncurrent on the consolidated balance sheets based upon the expected timing of satisfaction of respective performance obligations.

Dolaflexin Platform Agreement

In June 2014, the Company entered into a collaboration and commercial license agreement with Merck KGaA, Darmstadt Germany (as amended from time to time, the "2014 Merck KGaA Agreement"). The 2014 Merck KGaA Agreement provided Merck KGaA with the right to develop ADCs directed to six exclusive targets. In May 2018, the Company entered into a Supply Agreement with Merck KGaA, Darmstadt, Germany (as amended from time to time, the "2018 Merck KGaA Supply Agreement"). Under the terms of the 2018 Merck KGaA Supply Agreement, the Company could provide Merck KGaA preclinical non-good manufacturing practice ADC drug substance and clinical good manufacturing practice drug substance for use in clinical trials associated with one of the antibodies designated under the 2014 Merck KGaA Agreement. In the fourth quarter of 2023, the Company and Merck KGaA mutually agreed to terminate the 2014 Merck KGaA Agreement and the 2018 Merck KGaA Supply Agreement.

Accounting Analysis

The 2014 Merck KGaA Agreement and 2018 Merck KGaA Supply Agreement were terminated during the fourth quarter of 2023. As there are no further performance obligations, the Company recognized $3.7 million of revenue related to the termination of the 2014 Merck KGaA Agreement and the 2018 Merck KGaA Supply Agreement during the year ended December 31, 2023.

Prior to the termination of the agreements, the Company had identified the following performance obligations under the 2014 Merck KGaA Agreement: (i) exclusive license and research services for six designated targets, (ii) rights to future technological improvements and (iii) participation of project team leaders and providing joint research committee services.

The Company had concluded that each license for a designated target was not distinct from the research services performed related to the designated target as Merck KGaA could not obtain the benefit of the license without the related research services. Each license for a designated target and the related services performance obligation was considered distinct from every other license for a designated target and related services performance obligation as each research plan was pursued independent of every other research plan for other designated targets.

Collaboration revenue recognized related to the 2014 Merck KGaA Agreement and the 2018 Merck KGaA Supply Agreement during the year ended December 31, 2023 was $3.7 million. Collaboration revenue recognized related to the 2014 Merck KGaA Agreement and the 2018 Merck KGaA Supply Agreement during the years ended December 31, 2022 and 2021 was immaterial.

As of December 31, 2023, the Company did not have deferred revenue related to the 2014 Merck KGaA Agreement and 2018 Merck KGaA Supply Agreement. As of December 31, 2022, the Company had recorded $3.9 million in deferred revenue related to the 2014 Merck KGaA Agreement and 2018 Merck KGaA Supply Agreement, in the aggregate.

Summary of Contract Assets and Liabilities

The following table presents changes in the balances of the Company's contract liabilities:

	Balance at Beginning of Period	Additions	Deductions	Balance at End of Period
Year ended December 31, 2023				
Contract liabilities:				
Total deferred revenue	$ 147,653	$ 5,517	$ 27,856	$ 125,314
Year ended December 31, 2022				
Contract liabilities:				
Total deferred revenue	$ 3,944	$ 170,000	$ 26,291	$ 147,653

The Company did not record any contract assets associated with its collaboration agreements as of December 31, 2023 and December 31, 2022.

During the years ended December 31, 2023 and 2022 the Company recognized the following revenues as a result of changes in the contract liability balances in the respective periods:

	Year ended December 31,	
	2023	2022
Revenue recognized in the period from:		
Amounts included in the contract liability at the beginning of the period	$ 27,870	$ 43

Other Revenue

The Company has provided limited services for a collaborator, Asana Biosciences, LLC ("Asana Biosciences"), pursuant to a 2012 research, development and license agreement (the "Asana Biosciences Agreement"). During the year ended December 31, 2022, the Company recognized revenue of $0.3 million related to these services and did not recognize revenue related to these services during the years ended December 31, 2023 and 2021. During the year ended December 31, 2023, the Company recognized revenue of $2.5 million related to achievement of a development milestone under the Asana Biosciences Agreement.

4. Fair value measurements

The following table presents information about the Company's assets measured at fair value on a recurring basis and indicates the level within fair value hierarchy of the valuation techniques utilized to determine such value.

	December 31, 2023			
(in thousands)	Total	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Cash equivalents				
Money market funds	$ 90,649	$ 90,649	$ —	$ —
U.S. treasury securities	24,889	24,889	—	—
	$ 115,538	$ 115,538	$ —	$ —
Marketable securities				
U.S. treasury securities	$ 29,548	$ 29,548	$ —	$ —
U.S government agency securities	4,975	—	4,975	—
	$ 34,523	$ 29,548	$ 4,975	$ —

	December 31, 2022			
(in thousands)	Total	Quoted Prices in Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Cash equivalents				
Money market funds	$ 50,471	$ 50,471	$ —	$ —
U.S. government agency securities	9,993	—	9,993	—
	$ 60,464	$ 50,471	$ 9,993	$ —
Marketable securities				
U.S. treasury securities	$ 107,810	$ 107,810	$ —	$ —
U.S. government agency securities	44,017	—	44,017	—
	$ 151,827	$ 107,810	$ 44,017	$ —

There were no changes in valuation techniques or transfers between fair value measurement levels during the years ended December 31, 2023 and 2022.

Investments classified as Level 1 within the valuation hierarchy generally consist of U.S. treasury securities and money market funds, as the fair value is readily determinable based on active daily markets for identical securities. Investments classified as Level 2 within the valuation hierarchy generally consists of U.S. government agency securities, as the fair value is readily determinable based on active daily markets for similar securities and other observable inputs. The Company estimates the fair values of investments by taking into consideration valuations obtained from third-party pricing sources.

The carrying amounts reflected in the consolidated balance sheets for prepaid expenses and other current assets, accounts receivable, accounts payable and accrued expenses approximate their fair values due to their short-term nature.

As of December 31, 2023 and 2022, the carrying value of the Company’s outstanding borrowing under the New Credit Facility (as defined in Note 8) approximated fair value (a Level 2 fair value measurement), reflecting interest rates currently available to the Company. The New Credit Facility is discussed in more detail in Note 8, *Debt*.

5. Cash, cash equivalents, and short-term marketable securities

Cash and cash equivalents

The following table summarizes the Company's cash, cash equivalents, and restricted cash as of December 31, 2023 and 2022.

(in thousands)	Year Ended December 31, 2023		Year Ended December 31, 2022	
	Beginning of period	End of period	Beginning of period	End of period
Cash and cash equivalents	$ 128,885	$ 174,561	$ 177,947	$ 128,885
Restricted cash included in other assets, noncurrent	478	478	478	478
Total cash, cash equivalents and restricted cash per statement of cash flows	$ 129,363	$ 175,039	$ 178,425	$ 129,363

Marketable securities

The following table summarizes the Company's marketable securities held at December 31, 2023 and 2022.

	December 31, 2023			
(in thousands)	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Marketable securities				
U.S. treasury securities	$ 29,535	$ 13	$ —	$ 29,548
U.S. government agency securities	4,977	—	(2)	4,975
	$ 34,512	$ 13	$ (2)	$ 34,523

	December 31, 2022			
(in thousands)	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Marketable securities				
U.S. treasury securities	$ 107,964	$ 7	$ (161)	$ 107,810
U.S. government agency securities	44,016	24	(23)	44,017
Total	$ 151,980	$ 31	$ (184)	$ 151,827

All of the Company's marketable securities are due within one year or less. The Company did not realize any gains or losses on the sale of marketable securities during the years ended December 31, 2023 and 2022, and, as a result, the Company did not reclassify any amounts out of accumulated comprehensive loss.

As of December 31, 2023, the Company's debt security portfolio consisted of one security that was in an unrealized loss position and had an aggregate fair value of $5.0 million. There were no securities in an unrealized loss position for greater than 12 months as of December 31, 2023. The unrealized losses on the Company's marketable securities were caused by market interest rate increases. The Company has the intent and ability to hold such securities until recovery. The Company did not record any charges for credit-related impairments for its marketable securities during the years ended December 31, 2023 and 2022.

6. Property and equipment

Property and equipment consists of the following as of December 31, 2023 and 2022:

(in thousands)	December 31, 2023	December 31, 2022
Laboratory equipment	$ 8,246	$ 7,960
Leasehold improvements	2,206	1,943
Computers, software, and office equipment	2,449	1,824
Total property and equipment at cost	12,901	11,727
Less: Accumulated depreciation	(9,070)	(7,742)
	$ 3,831	$ 3,985

Depreciation expense for the years ended December 31, 2023, 2022 and 2021 was $1.5 million, $0.9 million and $0.9 million, respectively.

7. Accrued expenses

Accrued expenses consist of the following as of December 31, 2023 and 2022:

(in thousands)	December 31, 2023	December 31, 2022
Accrued payroll and related expenses	$ 8,807	$ 11,558
Accrued clinical expenses	5,063	14,822
Accrued research and non-clinical expenses	3,090	2,767
Accrued manufacturing expenses	2,566	11,536
Accrued restructuring expenses	1,047	—
Accrued professional fees	936	1,865
Accrued other	389	636
	$ 21,898	$ 43,184

8. Debt

On May 8, 2019, the Company entered into a loan and security agreement (the "Prior Credit Facility") with Silicon Valley Bank ("former SVB"), pursuant to which the Company borrowed $5.0 million. The Prior Credit Facility accrued interest at a floating per annum rate equal to the greater of (i) 4.0% and (ii) 1.50% below the Prime Rate. The Prior Credit Facility had an interest-only period through August 31, 2020.

On August 28, 2020, the Company entered into a second amendment (the "Second Amendment") to the Prior Credit Facility. Pursuant to the Second Amendment, the Company drew $5.2 million upon execution of the Second Amendment, the proceeds of which were used to repay the Company’s existing balance under the Prior Credit Facility and satisfy its obligations to former SVB. The Prior Credit Facility, as amended by the Second Amendment, accrued interest at a floating per annum rate equal to the greater of (i) 4.25% and (ii) 1.00% above the Prime Rate.

On October 29, 2021, the Company entered into a loan and security agreement (the "New Credit Facility") with former SVB and Oxford Finance LLC ("Oxford" and, together with former SVB and the other lenders from time to time a party thereto, the "Lenders"). In March 2023, Silicon Valley Bridge Bank, N.A ("SVBB"), as successor in interest to former SVB, replaced former SVB as a Lender, and then Silicon Valley Bank, a division of First-Citizens Bank & Trust Company ("SVB"), which assumed all deposits and loans of SVBB, subsequently replaced SVBB as a Lender. The New Credit Facility as amended on February 17, 2022, October 17, 2022, December 27, 2022, and March 23, 2023, is secured by substantially all of the Company's personal property owned or later acquired, excluding intellectual property (but including the rights to payments and proceeds from intellectual property), and a negative pledge on intellectual property. The Company drew $25.0 million upon execution of the New Credit Facility, of which $5.5 million of the proceeds was used to repay the existing balance under the Prior Credit Facility and satisfy its obligations to SVB. Upon entering into the New Credit Facility, the Company terminated all commitments by SVB to extend further credit under the Prior Credit Facility and all guarantees and security interests granted by the Company to SVB under the Prior Credit Facility. As of December 31, 2023, no additional borrowing amounts were available to the Company under the New Credit Facility, as amended.

The New Credit Facility bears interest at a floating per annum rate equal to the greater of (i) 8.50% and (ii) 5.25% above the Prime Rate. Interest is payable monthly in arrears on the first day of each month. The Company is obligated to make interest-only payments through November 1, 2024, followed by equal monthly principal payments and applicable interest through the maturity date of October 1, 2026 (the "Maturity Date"). If certain development milestones are met, then the interest-only period will be extended to November 1, 2025.

The Company is also required to make a final payment to the Lenders equal to 4.25% of the principal amount of the term loans then extended to the Company. This final payment is accreted under the effective interest method over the life of each term loan. The term loans are secured by substantially all of the Company’s assets, except for its intellectual property which is subject to a negative pledge, and certain other customary exclusions.

At the Company’s option, it may prepay the outstanding principal balance of any term loans in whole but not in part, subject to a prepayment fee of 1.0% of the term loans then extended to the Company if the prepayment occurs after the second anniversary of the funding date of such term loan but before the Maturity Date. The New Credit Facility includes customary affirmative and restrictive covenants applicable to the Company. Affirmative covenants include, among others, covenants requiring the Company to maintain its corporate existence and governmental approvals, deliver certain financial reports, maintain insurance coverage and satisfy certain requirements regarding deposit accounts. The restrictive covenants include, among others, requirements relating to the Company’s ability to transfer collateral, incur additional indebtedness, engage in mergers or acquisitions, pay dividends or make other distributions, make investments, create liens, sell assets and agree to a change in control, in each case subject to certain customary exceptions.

The Company’s payment obligations under the New Credit Facility are subject to acceleration upon the occurrence of specified events of default, which include, but are not limited to, the occurrence of a material adverse change in the Company’s business, operations, or financial or other condition. Amounts outstanding upon the occurrence of an event of default are payable upon the Lenders' demand and shall accrue interest at an additional rate of 5.0% per annum of the past due amount outstanding. As of December 31, 2023, the Company was in compliance with all covenants under the New Credit Facility. As such, as of December 31, 2023, the classification of the loan balance as stated on the balance sheet was based on the timing of defined future payment obligations.

The following is a summary of obligations under the New Credit Facility as of December 31, 2023:

(in thousands)	December 31, 2023
Total debt	$ 25,000
Less: Current portion of long-term-debt	(2,083)
Total debt, net of current portion	22,917
Debt financing costs, net of accretion	(237)
Accretion related to final payment	468
Long-term debt, net	$ 23,148

As of December 31, 2023, the estimated future principal payments due are as follows:

(in thousands)	
2024	$ 2,083
2025	12,500
2026	10,417
Total debt	$ 25,000

Interest expense related to the New Credit Facility for the years ended December 31, 2023 and 2022 was $3.9 million and $3.2 million, respectively. The Company did not recognize any interest expense related to the New Credit Facility during the year ended December 31, 2021. Interest expense related to the Prior Credit Facility for the year ended December 31, 2021 was $0.8 million. The Company did not recognize any interest expense related to the Prior Credit Facility during the years ended December 31, 2023 and 2022.

9. Stockholders' equity

Preferred stock

As of December 31, 2023, the Company had 25,000,000 shares of authorized preferred stock. No shares of preferred stock have been issued.

At-the-market ("ATM") equity offering program

In May 2020, the Company established an ATM equity offering program (the "2020 ATM"), pursuant to which it was able to offer and sell up to $100.0 million of its common stock from time to time at prevailing market prices. During the year ended December 31, 2021, the Company sold 3,961,074 shares of common stock, resulting in net proceeds of $43.1 million. During the year ended December 31, 2022, the Company sold 11,740,210 shares of common stock under the 2020 ATM, resulting in net proceeds of $54.8 million. As of December 31, 2022, the 2020 ATM had been fully utilized.

In February 2022, the Company established a new ATM equity offering program (the "February 2022 ATM"), pursuant to which it was able to offer and sell up to $100.0 million of its common stock from time to time at prevailing market prices. During the year ended December 31, 2022, the Company sold 18,757,665 shares of common stock under the February 2022 ATM, resulting in net proceeds of $96.4 million. During the year ended December 31, 2023, the Company sold 256,386 shares of common stock under the February 2022 ATM, resulting in net proceeds of $1.6 million. As of December 31, 2023, the February 2022 ATM had been fully utilized.

In November 2022, the Company established an additional ATM equity offering program (the "November 2022 ATM"), pursuant to which it is able to offer and sell up to $150.0 million of its common stock from time to time at prevailing market prices. During the year ended December 31, 2023, the Company sold 14,208,145 shares of common stock under the November 2022 ATM, resulting in net proceeds of $92.2 million. As of December 31, 2023, approximately $55.9 million remained unsold and available for sale under the November 2022 ATM.

Warrants

In connection with a 2013 Series A-1 Preferred Stock issuance, the Company granted to certain investors warrants to purchase shares of common stock. All such outstanding warrants expired pursuant to their terms on September 27, 2023. The warrants had a $0.05 per share exercise price and a contractual life of 10 years. The fair value of these warrants was recorded as a component of equity at the time of issuance. As of December 31, 2023, there were no warrants to purchase shares of common stock outstanding. During the year ended December 31, 2022, the Company issued 16,654 shares of common stock upon the net exercise of warrants.

Common Stock

At the Company's 2022 Annual Meeting of Stockholders on June 9, 2022, the Company's stockholders approved an amendment to the Company's Fifth Amended and Restated Certificate of Incorporation to increase the number of authorized shares of common stock, $0.0001 par value per share, from 175,000,000 to 350,000,000. This increase became effective upon filing of a Certificate of Amendment with the Secretary of State of the State of Delaware on June 9, 2022.

The holders of the common stock are entitled to one vote for each share held. Common stockholders are not entitled to receive dividends, unless declared by the Board of Directors of the Company (the "Board").

As of December 31, 2023 and 2022 there were 14,736,953 and 11,944,664, respectively, shares of common stock reserved for the exercise of outstanding stock options, restricted stock units ("RSUs") and warrants.

	December 31, 2023	December 31, 2022
Stock options	10,902,845	10,051,283
Restricted stock units	3,834,108	1,870,791
Warrants	—	22,590
	14,736,953	11,944,664

10. Stock-based compensation

Stock incentive plans

Prior to its initial public offering, the Company granted stock options pursuant to the Company's 2007 Stock Incentive Plan (the "2007 Plan"). The 2007 Plan expired in June 2017. Any cancellations or forfeitures of options granted under the 2007 Plan will increase the options available under the Company's 2017 Stock Incentive Plan (the "2017 Plan"), as described below.

In June 2017 the Company's stockholders approved the 2017 Plan. Under the 2017 Plan, shares of common stock could be granted to the Company's employees, officers, directors, consultants and advisors in the form of options, restricted stock units ("RSUs") or other stock-based awards. The number of shares of common stock issuable under the 2017 Plan will be cumulatively increased annually on January 1 by the lesser of (a) 4% of the outstanding shares on the immediately preceding December 31 or (b) such other amount specified by the Board. The terms of the awards are determined by the Board, subject to the provisions of the 2017 Plan. Any cancellations or forfeitures of options granted under the 2007 Plan, which expired in June 2017, would increase the number of shares that could be granted under the 2017 Plan. On January 1, 2023, the number of shares of common stock issuable under the 2017 Plan was increased by 4,205,794 shares. During the year ended December 31, 2023, the Company granted an aggregate of 7,211,153 RSUs, options to purchase shares of common stock, and shares of common stock to employees and non-employee directors under the 2017 Plan. As of December 31, 2023 there were 2,043,328 shares available for future issuance under the 2017 Plan.

Under the 2017 Plan, both with respect to incentive stock options and nonqualified stock options, the exercise price per share will not be less than the fair market value of the common stock on the date of grant, and the vesting period for options granted to employees is generally four years. In accordance with the Company's non-employee director compensation policy, as in effect from time to time, options granted to non-employee directors in lieu of cash retainer fees earned are fully vested upon grant, options granted to non-employee directors upon initial election to the board of directors vest over three years, and options granted to non-employee directors on the date of each of annual meeting of stockholders vest over one year. Options granted under the 2017 Plan expire no later than 10 years from the date of grant. Options under the 2007 Plan were granted at an exercise price established by the Board (or an authorized committee thereof) that was not less than the fair market value of the underlying common stock on the date of grant and subject to such vesting provisions determined by the Board (or an authorized committee thereof). The Board may accelerate vesting or otherwise adjust the terms of granted options in the case of a merger, consolidation, dissolution, or liquidation of the Company.

Inducement awards

From time to time, the Company grants to its employees, upon approval by the Board or an authorized committee thereof, options to purchase shares of common stock and/or RSUs as an inducement to employment in accordance with Nasdaq Listing Rule 5635(c)(4). Prior to February 2022, only options to purchase shares of common stock were granted as inducement awards, and they were granted outside of an existing equity incentive plan. These options are subject to terms substantially the same as the 2017 Plan.

In February 2022, the Board adopted the Company's 2022 Inducement Stock Incentive Plan (the "Inducement Plan"), which provides for the grant of nonstatutory options, stock appreciation rights, restricted stock, RSUs and other stock-based awards, with respect to an aggregate of 2,000,000 shares of the Company's common stock (subject to adjustment as provided in the Inducement Plan). During the year ended December 31, 2023, the Company granted an aggregate of 877,575 RSUs and options to purchase shares of common stock to newly hired employees under the Inducement Plan. As of December 31, 2023, there were 1,170,752 shares available for future issuance under the Inducement Plan.

As of December 31, 2023 there were options to purchase 457,500 shares of common stock outstanding which were granted as inducement awards prior to establishment of the Inducement Plan.

Stock option activity

A summary of stock option activity is as follows:

	Number of Shares	Weighted-Average Exercise Price	Weighted Average Remaining Contractual Term	Aggregate Intrinsic Value
Outstanding at January 1, 2023	10,051,283	$ 9.84	7.2	$ 8,197
Granted	4,017,763	$ 4.76		
Exercised	(102,596)	$ 4.25		
Cancelled/forfeited	(3,063,605)	$ 12.00		
Outstanding at December 31, 2023	10,902,845	$ 7.42	6.8	$ 1,786
Exercisable at December 31, 2023	6,499,540	$ 8.23	5.5	$ 711

The weighted-average grant date fair value of options granted during the years ended December 31, 2023, 2022 and 2021, was $3.82, $3.97 and $11.71 per share, respectively. The total intrinsic value of options exercised during the years ended December 31, 2023, 2022 and 2021, was $0.3 million, $1.5 million, and $4.3 million, respectively. The aggregate intrinsic value represents the difference between the exercise price and the selling price received by option holders upon the exercise of stock options during the period.

Cash received from the exercise of stock options was $0.4 million, $1.3 million and $1.8 million for the years ended December 31, 2023, 2022 and 2021, respectively.

Restricted stock units and other stock awards

The Company periodically issues RSUs with a service condition to certain officers and other employees that typically vest between one year and four years from the grant date. In accordance with its non-employee director compensation policy, as in effect from time to time, the Company annually issues RSUs with a service condition to non-employee directors that typically vest one year from the date of grant, and the Company also issues shares of common stock in lieu of cash retainer fees earned to certain non-employee directors, which shares are fully vested upon grant.

A summary of the RSU activity is as follows:

	Number of Shares	Weighted-Average Remaining Contractual Term	Aggregate Intrinsic Value	Weighted-Average Grant Date Fair Value
Unvested at January 1, 2023	1,870,791	1.5	$ 10,963	$ 8.55
Granted	4,025,544	—		$ 4.42
Vested	(572,825)	—		$ 8.83
Forfeited	(1,489,402)	—		$ 6.25
Unvested at December 31, 2023	3,834,108	1.4	$ 8,895	$ 5.01

The total fair value of RSUs vested during the years ended December 31, 2023, 2022 and 2021 was $3.1 million, $1.5 million and $5.8 million respectively.

Employee stock purchase plan

During the year ended December 31, 2017, the Board adopted, and the Company's stockholders approved the 2017 employee stock purchase plan (the "2017 ESPP"). The Company initially reserved 225,000 shares of common stock for issuance under the 2017 ESPP, plus an annual increase, to be added as of January 1st of each year, equal to the least of (i) 450,000 shares of common stock; (ii) one percent of the number of shares of common stock outstanding as of the close of business on the immediately preceding December 31st; and (iii) the number of shares of common stock determined by the Board on or prior to such date for such year, up to maximum of 4,725,000 shares of common stock in the aggregate. The number of shares of common stock issuable under the 2017 ESPP was increased by 450,000 on January 1, 2023. During the years ended December 31, 2023 and 2022 the Company issued 381,508 and 270,774 shares, respectively, under the 2017 ESPP. As of December 31, 2023, there were 364,283 shares available for issuance under the 2017 ESPP.

Stock-based compensation expense

The Company uses the provisions of ASC 718 to account for all stock-based awards to employees and non-employees.

Stock-based compensation expense is recognized over the requisite service period, which is generally the vesting period, using the straight-line method.

The following table presents stock-based compensation expense by award type included within the Company's consolidated statements of operations and comprehensive loss:

	Year ended December 31,		
(in thousands)	2023	2022	2021
Stock options	$ 14,171	$ 15,814	$ 14,528
Restricted stock units and other stock awards	6,184	5,175	3,522
Employee stock purchase plan	781	533	359
Stock-based compensation expense included in total operating expenses	$ 21,136	$ 21,522	$ 18,409

The following table presents stock-based compensation expense as reflected in the Company's consolidated statements of operations and comprehensive loss:

	Year ended December 31,		
(in thousands)	**2023**	**2022**	**2021**
Research and development	$ 11,043	$ 11,386	$ 9,984
General and administrative	10,093	10,136	8,425
Stock-based compensation expense included in total operating expenses	$ 21,136	$ 21,522	$ 18,409

As of December 31, 2023, there was $14.8 million and $11.8 million of unrecognized stock-based compensation expense related to unvested stock options and unvested RSUs, respectively, that is expected to be recognized over a weighted average period of 1.6 years and 2.4 years, respectively.

The fair value of each option award is estimated on the date of grant using the Black–Scholes option pricing model with the following weighted average assumptions:

	December 31,		
	2023	**2022**	**2021**
Risk-free interest rate	3.8 %	2.1 %	0.9 %
Expected dividend yield	— %	— %	— %
Expected term (years)	6.05	5.99	6.06
Expected stock price volatility	103 %	88 %	82 %

Expected volatility for the Company's common stock is currently determined based on its historical volatility. See Note 2, *Summary of significant accounting policies*, for more information. The risk-free interest rate is based on the yield of U.S. Treasury securities consistent with the expected term of the option. No dividend yield was assumed as the Company has not historically and does not expect to pay dividends on its common stock. The expected term of the options granted is based on the use of the simplified method, in which the expected term is presumed to be the mid-point between the vesting date and the end of the contractual term.

The fair value of RSUs is determined based on the closing price of the Company's common stock on the date of grant.

11. Net loss per share

Basic net loss per share of common stock is calculated by dividing the net loss attributable to common stockholders by the weighted-average number of shares of common stock outstanding during the period, without further consideration for potentially dilutive securities. Diluted net loss per share is computed by dividing the net loss attributable to common stockholders by the weighted-average number of shares of common stock and potentially dilutive securities outstanding for the period determined using the treasury stock method.

For purposes of the diluted net loss per share calculation, stock options, unvested RSUs and warrants to purchase common stock are considered to be potentially dilutive securities, but are excluded from the calculation of diluted net loss per share because their effect would be anti-dilutive and therefore, basic and diluted net loss per share were the same for all periods presented.

The following table sets forth the outstanding potentially dilutive securities that have been excluded from the calculation of diluted net loss per share because to include them would be anti-dilutive (in common stock equivalent shares):

	Year ended December 31,		
	2023	2022	2021
Stock options	10,902,845	10,051,283	8,342,429
Unvested restricted stock units	3,834,108	1,870,791	817,609
Warrants	—	22,590	39,474
	14,736,953	11,944,664	9,199,512

12. Leases

The Company has an operating lease for its office and lab space in Cambridge, Massachusetts and operating and finance leases for certain equipment. In March 2020, the Company entered into the Seventh Amendment to the office and lab space lease ("the Office Lease") to extend the term of the lease through March 2026. The Company has an option to extend the lease term of the Office Lease for an additional five years.

On April 5, 2021, the Company entered into an Eighth Amendment to the Office Lease, which granted the Company additional office space in its existing building for five years, beginning July 1, 2021, and committed the Company to lease payments of $5.0 million over that period (the "Expansion Lease"). Independent from the option under the Office Lease, the Company has an option to extend the lease term of the Expansion Lease for an additional five years. The Company's exercise of the options to extend the lease terms of both the Office Lease and Expansion Lease were not considered reasonably certain as of December 31, 2023.

The Expansion Agreement is a lease modification accounted for as a separate contract, because it expands the scope of the Office Lease and the additional lease payments are commensurate with market rents. The Company assessed the lease classification of the Expansion Lease as of the date of signing and determined that the Expansion Lease should be accounted for as an operating lease. The right-of-use asset and corresponding operating lease liability have been calculated based on the present value of lease payments over the lease term. The Company determined the appropriate incremental borrowing rate to utilize as a discount rate by using a synthetic credit rating which was estimated based on an analysis of outstanding debt of companies with similar credit and financial profiles. Since the operating lease is a net lease, as the non-lease components (i.e., common area maintenance) are paid separately from rent based on actual costs incurred, such non-lease components were not included in the ROU asset and liability and are reflected as an expense in the period incurred.

The Company had a standby letter of credit agreement for the benefit of its landlord in the amount of $0.5 million in connection with the Office Lease and Expansion Lease as of December 31, 2023 and 2022.

The Company has remaining finance lease terms of one year to five years for certain equipment, some of which include options to purchase at fair value.

The components of lease expense included in research and development and general and administrative expenses in the statement of operations and comprehensive loss were as follows:

	Years ended December 31,		
(in thousands)	**2023**	**2022**	**2021**
Operating lease cost	$ 3,838	$ 3,793	$ 3,502
Finance lease cost:			
Amortization of right-of-use assets	$ 185	$ 194	$ 169
Interest on lease liabilities	16	28	28
	$ 201	$ 222	$ 197

Supplemental balance sheet information related to leases was as follows:

	Year ended December 31,	
	2023	2022
Operating leases:		
Operating lease right-of-use assets	$ 7,694	$ 10,475
Operating lease liabilities, current	$ 3,252	$ 2,798
Operating lease liabilities	$ 5,149	$ 8,575
Finance leases:		
Property and equipment, gross	$ 1,038	$ 1,038
Property and equipment, accumulated depreciation	$ (723)	$ (539)
Other liabilities, current	$ 144	$ 240
Other liabilities	$ 54	$ 203
Weighted-average remaining lease term:		
Operating leases	2.3 years	3.3 years
Finance leases	1.1 years	2.0 years
Weighted-average discount rate:		
Operating leases	10.8 %	10.8 %
Finance leases	4.4 %	5.4 %

Supplemental cash flow information related to leases was as follows:

	Year ended December 31,	
(in thousands)	2023	2022
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from operating leases	$ 4,029	$ 3,865
Operating cash flows from finance leases	$ 16	$ 28
Financing cash flows from finance leases	$ 262	$ 272

Future lease payments under non-cancellable leases as of December 31, 2023 were as follows:

(in thousands)	Operating leases	Finance leases
2024	$ 3,975	$ 141
2025	4,187	48
2026	1,310	8
2027 and thereafter	—	—
Total lease payments	9,472	197
Present value adjustment	(1,069)	—
Present value of lease liabilities	$ 8,403	$ 197

13. Income taxes

For the years ended December 31, 2023, 2022 and 2021, the Company recorded no income tax benefit for the net operating losses ("NOLs") incurred in each year, due to the Company’s operating losses and a full valuation allowance on deferred tax assets.

A reconciliation of the effective tax rate for the years ended December 31, 2023 and 2022 is as follows:

	2023	2022
Statutory US Federal Rate	21.0 %	21.0 %
State taxes, net of federal benefit	5.5 %	5.7 %
Permanent differences	(0.1)%	(0.1)%
General business credits	4.0 %	4.4 %
Stock compensation	(1.9)%	(1.4)%
Change in valuation allowance	(28.5)%	(29.6)%
	— %	— %

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of the Company's net deferred tax assets as of December 31, 2023 and 2022 are as follows:

(in thousands)	2023	2022
Deferred tax assets:		
Net operating losses	$ 126,798	$ 113,981
R&D capitalization	67,107	40,380
Tax credit carryforwards	28,409	21,429
Stock-based compensation	6,899	6,522
Accrued expenses	3,142	3,340
Lease liabilities	2,274	3,096
Capitalized licenses	2,725	3,077
Deferred revenue	3,688	1,062
Depreciation	353	437
Other	156	116
Total gross deferred tax assets	241,551	193,440
Valuation allowance	(239,468)	(190,588)
Net deferred tax assets less valuation allowance	2,083	2,852
Deferred tax liabilities		
Right-of-use assets	(2,083)	(2,852)
Total gross deferred tax liabilities	(2,083)	(2,852)
Net deferred taxes	$ —	$ —

The Company has incurred NOLs since inception. At December 31, 2023, the Company had federal and state NOL carryforwards of approximately $479.0 million and $414.8 million, respectively. Of the $479.0 million of federal NOL carryforwards, $34.1 million expire at various dates through 2037. The remaining $444.8 million of federal NOL carryforwards do not expire. The state NOL carryforwards expire at various dates through 2043. At December 31, 2023, the Company had federal and state research and development tax credit carryforwards of approximately $23.2 million and $6.8 million, respectively, which expire at various dates through 2043.

As required by ASC 740, management of the Company has evaluated the evidence bearing upon the reliability of its deferred tax assets. Based on the weight of available evidence, both positive and negative, management has determined that it is more likely than not that the Company will not realize the benefits of all of these assets. Accordingly, the Company recorded a valuation allowance of $239.5 million and $190.6 million at December 31, 2023 and December 31, 2022, respectively. The valuation allowance increased by $48.9 million during the year ended December 31, 2023, primarily a result of the Company's current year net loss and credit generation.

Utilization of the NOLs and research and development tax credit carryforwards may be subject to a substantial annual limitation under Section 382 due to ownership change limitations that have occurred previously or that could occur in the future in accordance with Section 382, as well as similar state provisions. These ownership changes may limit the amount of NOLs and research and development tax credit carryforwards that can be utilized annually to offset future taxable income and tax, respectively. If a change in control as defined by Section 382 has occurred at any time since the Company's formation, utilization of its NOLs or research and development tax credit carryforwards would be subject to an annual limitation under Section 382, which is determined by first multiplying the value of the Company's stock at the time of the ownership change by the applicable long-term tax-exempt rate, which could then be subject to additional adjustments, as required. Any limitation may result in expiration of a portion of the NOLs or research and development tax carryforwards before their utilization. The Company has determined that ownership changes have occurred in the past and that certain NOLs and research and development tax credit carryforwards will be subject to limitation.

The Company applies the accounting guidance in ASC 740 related to accounting for uncertainty in income taxes. The Company's reserves related to taxes are based on a determination of whether, and how much of, a tax benefit taken by the Company in its tax filings or positions is more likely than not to be realized following resolution of any potential contingencies present related to the tax benefit. As of December 31, 2023 and 2022, the Company had no unrecognized tax benefits.

The Company commissioned a multi-year research and development credit study in 2023, which resulted in an adjustment to the Company's cumulative deferred tax asset as of December 31, 2023. The change in the deferred tax asset is offset by a full valuation allowance.

Interest and penalties related to uncertain tax positions would be classified as income tax expense in the accompanying statements of operations and comprehensive loss. As of December 31, 2023 and 2022, the Company had no accrued interest or penalties related to uncertain tax positions.

The Company files income tax returns in the United States federal tax jurisdiction and eight state jurisdictions. The Company did not have any foreign operations during the years ended December 31, 2023, 2022 and 2021. The statute of limitations for assessment by the Internal Revenue Service and state tax authorities is closed for tax years prior to 2019, although carryforward attributes that were generated prior to tax year 2019 may still be adjusted upon examination to the extent utilized in a future period. There are no federal or state audits currently in progress.

14. Employee benefit plan

The Company has a defined contribution plan established under Section 401(k) of the Code ("401(k) Plan"), which covers substantially all employees. Employees who have attained the age of 21 and have worked more than 1,000 hours are eligible to participate in the 401(k) Plan. Employees may contribute up to 95% of eligible pay on a pre–tax basis up to the federal annual limits. For the years ended December 2023, 2022, and 2021, the Company made matching contributions equal to 100% of the employee's contributions, subject to a maximum of 4% of eligible compensation. For the years ended December 31, 2023, 2022 and 2021, the Company recorded expense of $1.3 million, $1.1 million and $0.8 million, respectively, related to its contribution to its 401(k) Plan.

15. Commitments

License agreements

During the year ended December 31, 2023, the Company did not record research and development expense related to non-refundable license payments. During the years ended December 31, 2022 and 2021, the Company recorded research and development expense related to non-refundable license payments of $1.5 million and $3.1 million, respectively.

During the year ended December 31, 2023, the Company did not record research and development expense related to development milestones. During the years ended December 31, 2022 and 2021, the Company recorded research and development expense related to development milestones of $0.7 million and $2.1 million, respectively. The 2022 and 2021 development milestones were associated with XMT-1660 and UpRi, respectively.

See Note 12, *Leases,* for the Company's future obligations related to leases as of December 31, 2023.

16. Restructuring

On July 27, 2023, the Company announced decisions to reprioritize its areas of focus and to discontinue its clinical development of UpRi following an evaluation of top-line data from the Company's UPLIFT Phase 2 clinical trial of UpRi in patients with platinum-resistant ovarian cancer, which did not meet its primary endpoint. In connection with these decisions, on July 26, 2023 the Company's board of directors approved certain expense reduction measures, including a reduction of approximately 50% of the Company's then-current total employee base (the "Restructuring"). Affected employees were eligible to receive severance and benefit payments, notice pay and outplacement services in connection with the reduction.

As of December 31, 2023, the Restructuring was substantially completed. Restructuring costs incurred are included within restructuring expenses on the consolidated statements of operations and comprehensive loss.

The following table summarizes the charges incurred in connection with the Restructuring:

(in thousands)	Severance & Employee Related Costs	Contract Termination and Other Costs	Total Costs
Cumulative costs to date	$ 6,924	$ 1,789	$ 8,713
Costs incurred during the year ended December 31, 2023	$ 6,924	$ 1,789	$ 8,713

The following tables summarizes the charges incurred in connection with the Restructuring related to research and development activities and general and administrative activities:

(in thousands)	Year ended December 31, 2023
Research and development related	$ 5,393
General and administrative related	$ 3,320

Accrued restructuring costs, which are included in accrued expenses on the consolidated balance sheets, were as follows:

(in thousands)	Severance & Employee Related Costs	Contract Termination Costs	Total Costs
Balance at December 31, 2022	$ —	$ —	$ —
Additional expense	6,924	372	7,296
Cash payments	(5,917)	—	(5,917)
Other adjustments	(252)	(80)	(332)
Balance at December 31, 2023	$ 755	$ 292	$ 1,047

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," as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or the Exchange Act, that are designed to ensure that information required to be disclosed in the reports that we file or submit under the Exchange Act is (1) recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms and (2) accumulated and communicated to our management, including our principal executive and principal financial officer, as appropriate to allow timely decisions regarding required disclosure. Our management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and our management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Our disclosure controls and procedures are designed to provide reasonable assurance of achieving their control objectives.

Our management, with the participation of our principal executive officer and principal financial officer, has evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2023, the end of the period covered by this Annual Report on Form 10-K. Based upon such evaluation, our principal executive officer and principal financial officer have concluded that our disclosure controls and procedures were effective at the reasonable assurance level as of such date.

Internal Control Over Financial Reporting

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over our financial reporting. Internal control over financial reporting is defined in Rules 13a-15(f) and 15d-15(f) promulgated under the Exchange Act as a process designed by, or under the supervision of, our principal executive and principal financial officers and effected by our board of directors, management and other personnel to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with U.S. generally accepted accounting principles, or GAAP. Our internal control over financial reporting includes those policies and procedures that:

- pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect our transactions and dispositions of our assets;
- provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. GAAP, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and
- provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on our financial statements.

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

Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2023. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in its 2013 Internal Control — Integrated Framework. Based on our assessment, our management has concluded that, as of December 31, 2023, our internal control over financial reporting is effective based on those criteria.

Changes in Internal Control over Financial Reporting

No change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) occurred during the three months ended December 31, 2023 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

Director and Officer Trading Arrangements

A significant portion of the compensation of our directors and officers (as defined in Rule 16a-1(f) under the Securities Exchange Act of 193, as amended, or the Exchange Act) is in the form of equity awards and, from time to time, directors and officers engage in open-market transactions with respect to the securities acquired pursuant to such equity awards or other company securities, including to satisfy tax withholding obligations when equity awards vest or are exercised, and for diversification or other personal reasons. Transactions in our securities by directors and officers are required to be made in accordance with our insider trading policy, which requires that the transactions be in accordance with applicable U.S. federal securities laws that prohibit trading while in possession of material nonpublic information. Rule 10b5-1 under the Exchange Act provides an affirmative defense that enables directors and officers to prearrange transactions in our securities in a manner that avoids concerns about initiating transactions while in possession of material nonpublic information.

During the fourth quarter of 2023, on November 7, 2023, Martin Huber, M.D., our President and Chief Executive and a member of our board of directors, adopted a Rule 10b5-1 trading arrangement intended to qualify as an "eligible sell to cover transaction" (as described in Rule 10b5-1(c)(1)(ii)(D)(3) under the Exchange Act). This sell to cover arrangement applies to restricted stock units, or RSUs, granted to him from time to time, whether vesting is based on the passage of time and/or the achievement of performance goals (other than those RSUs which by their terms require the us to withhold shares for tax withholding obligations in connection with vesting and settlement). This arrangement provides for the automatic sale of shares of our common stock that would otherwise be issuable on each settlement date of a covered RSU in an amount necessary to satisfy the applicable withholding obligation, with the proceeds of the sale delivered to us in the satisfaction of the applicable withholding obligation. The number of shares that will be sold under this arrangement is not currently determinable as the number will vary based on the extent to which vesting conditions are satisfied, the market price our common stock at the time of settlement and the potential future grant of additional RSUs subject to this arrangement.

Other than the above, no other director or officer has adopted or terminated a Rule 10b5–1 trading arrangement or a non-10b5-1 trading arrangement (as defined in Item 408(c) of Regulation S-K) during the fourth quarter of 2023.

ITEM 9C. DISCLOSURE REGARDING FOREIGN JURISDICTIONS THAT PREVENT INSPECTIONS

Not applicable.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Other than as noted below, the information required by this item is incorporated by reference to the information set forth in the sections titled "Proposal No. 1 – Election of Directors," "Executive Officers," and "Information Regarding the Board of Directors and Corporate Governance" and "Delinquent Section 16(a) Reports," if any, in our definitive proxy statement for our 2023 annual meeting of stockholders to be filed with the Securities and Exchange Commission within 120 days after the end of our fiscal year ended December 31, 2023, or the 2024 Proxy Statement.

We post our Code of Business Conduct and Ethics, which applies to our directors, officers, and employees, including our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions, in the “Corporate Governance” sub-section of the “Investors & Media” section (https://ir.mersana.com) of our corporate website https://mersana.com/. We intend to disclose on our website any amendments to, or waivers from, the Code of Business Conduct and Ethics that are required to be disclosed pursuant to the disclosure requirements of Item 5.05 of Form 8-K.

ITEM 11. EXECUTIVE COMPENSATION

The information required by this item (other than the information required by Item 402(v) of Regulation S-K) is incorporated by reference to the information set forth in the sections titled "Executive Compensation" and "Information Regarding the Board of Directors and Corporate Governance - Compensation Committee Interlocks and Insider Participation" in our 2024 Proxy Statement.

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

The information required by this item is incorporated by reference to the information set forth in the sections titled "Security Ownership of Certain Beneficial Owners and Management" and "Securities Authorized for Issuance Under Equity Compensation Plans" in our 2024 Proxy Statement.

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

The information required by this item is incorporated by reference to the information set forth in the sections titled "Certain Relationships and Related Party Transactions" and "Information Regarding the Board of Directors and Corporate Governance – Director Independence" in our 2024 Proxy Statement.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by this item is incorporated by reference to the information set forth in the sections titled "Principal Accountant Fees and Services" and "Audit Committee Pre-Approval Policy and Procedures" in our 2024 Proxy Statement.

PART IV

ITEM 15. EXHIBIT AND FINANCIAL STATEMENT SCHEDULES

(a)(1) Financial Statements

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

(a)(2) Financial Statement Schedules

All schedules are omitted because they are not required or are not applicable or because the information required is included in the consolidated financial statements or the notes thereto.

(a)(3) Exhibits

Exhibit Number	Description of Exhibit
3.1	Fifth Amended and Restated Certificate of Incorporation, as amended, as of June 8, 2023 (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed with the SEC on June 9, 2023).
3.2	Second Amended and Restated Bylaws (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed with the SEC on March 31, 2023).
4.1	Description of Securities (incorporated by reference to Exhibit 4.3 to the Annual Report on Form 10-K (File No. 001-38129) filed with the SEC on February 28, 2023).
10.1†	Form of Indemnification Agreement (incorporated by reference to Exhibit 10.1 to Amendment No. 1 to Registration Statement on Form S-1 (File No. 333-218412) filed with the SEC on June 16, 2017).
10.2	Commercial Lease, dated February 24, 2009, between Mersana Therapeutics, Inc. and Rivertech Associates II, LLC (incorporated by reference to Exhibit 10.2 to the Registration Statement on Form S-1 (File No. 333-218412) filed with the SEC on June 1, 2017).
10.3	Seventh Lease Extension and Modification Agreement to the Lease Between Rivertech Associates II LLC and Mersana Therapeutics, Inc., dated March 10, 2020, by and between Mersana Therapeutics, Inc. and Rivertech Associates II LLC (incorporated by reference to Exhibit 10.1 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on May 8, 2020).
10.4	Eighth Lease Modification Agreement to the Lease Between Rivertech Associates II LLC and Mersana Therapeutics, Inc., effective as of April 5, 2021, by and between Mersana Therapeutics, Inc. and Rivertech Associates II LLC (incorporated by reference to Exhibit 10.1 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on May 10, 2021).
10.5+	Amended and Restated Commercial License and Option Agreement, dated November 23, 2021, by and between Synaffix B.V. and Mersana Therapeutics, Inc. (incorporated by reference to Exhibit 10.15 to Annual Report on Form 10-K (File No. 001-38129) filed with the SEC on February 28, 2022).
10.6+	Amendment No. 1 to the Amended and Restated Commercial License and Option Agreement, dated February 2, 2022, between Mersana Therapeutics, Inc. and Synaffix B.V. (incorporated by reference to Exhibit 10.3 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on May 9, 2022).
10.7+	Research Collaboration and License Agreement, dated February 2, 2022, between Mersana Therapeutics, Inc. and Janssen Biotech, Inc. (incorporated by reference to Exhibit 10.2 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on May 9, 2022).
10.8+	Amendment No. 1 to the Research Collaboration and License Agreement (effective February 2, 2022), dated July 14, 2023, by and between Mersana Therapeutics, Inc. and Janssen Biotech, Inc. (incorporated by reference to Exhibit 10.1 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on November 7, 2023).

10.9+	Amendment No. 2 to the Research Collaboration and License Agreement (effective February 2, 2022), dated September 25, 2023, by and between Mersana Therapeutics, Inc. and Janssen Biotech, Inc. (incorporated by reference to Exhibit 10.2 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on November 7, 2023).
10.10+	Collaboration, Option and License Agreement, dated August 6, 2022, between Mersana Therapeutics, Inc. and GlaxoSmithKline Intellectual Property (No. 4) Limited (incorporated by reference to Exhibit 10.1 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on November 7, 2022).
10.11+	Collaboration and Commercial License Agreement, dated December 22, 2022, between Mersana Therapeutics, Inc. and Ares Trading S.A. (incorporated by reference to Exhibit 10.18 to the Annual Report on Form 10-K (File No. 001-38129) filed with the SEC on February 28, 2023).
10.12+	Loan and Security Agreement, dated October 29, 2021, by and between Oxford Finance LLC, Silicon Valley Bank and Mersana Therapeutics, Inc. (incorporated by reference to Exhibit 10.14 to Annual Report on Form 10-K (File No. 001-38129) filed with the SEC on February 28, 2022).
10.13+	First Amendment to Loan and Security Agreement, dated February 17, 2022, between Oxford Finance LLC, the Lenders named therein including Silicon Valley Bank, and Mersana Therapeutics, Inc. (incorporated by reference to Exhibit 10.4 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on May 9, 2022).
10.14+	Second Amendment to Loan and Security Agreement, dated October 17, 2022, between Oxford Finance LLC, the Lenders named therein including Silicon Valley Bank, and Mersana Therapeutics, Inc. (incorporated by reference to Exhibit 10.21 to the Annual Report on Form 10-K (File No. 001-38129) filed with the SEC on February 28, 2023).
10.15	Third Amendment to Loan and Security Agreement, dated December 27, 2022, between Oxford Finance LLC, the Lenders named therein including Silicon Valley Bank, and Mersana Therapeutics, Inc. (incorporated by reference to Exhibit 10.22 to the Annual Report on Form 10-K (File No. 001-38129) filed with the SEC on February 28, 2023).
10.16	Fourth Amendment to Loan and Security Agreement, dated March 23, 2023, between Oxford Finance LLC, the Lenders named therein including Silicon Valley Bridge Bank, N.A., and Mersana Therapeutics, Inc. (incorporated by reference to Exhibit 10.1 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on May 9, 2023).
10.17	Sales Agreement, dated November 7, 2022, between Mersana Therapeutics, Inc. and Cowen and Company, LLC (incorporated by reference to Exhibit 1.1 to the Current Report on Form 8-K (File No. 001-38129) filed with the SEC on November 7, 2022).
10.18†	Amended and Restated Offer Letter, by and between Mersana Therapeutics, Inc. and Anna Protopapas, dated March 17, 2017 (incorporated by reference to Exhibit 10.16 to the Registration Statement on Form S-1 (File No. 333-218412) filed with the SEC on June 1, 2017).
10.19†	Amended and Restated Offer Letter, by and between Mersana Therapeutics, Inc. and Timothy B. Lowinger, dated March 8, 2017 (incorporated by reference to Exhibit 10.18 to the Registration Statement on Form S-1 (File No. 333-218412) filed with the SEC on June 1, 2017).
10.20†	Offer Letter, by and between Mersana Therapeutics, Inc. and Brian DeSchuytner, dated June 10, 2019 (incorporated by reference to Exhibit 10.3 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on May 8, 2020).
10.21†	Offer Letter, by and between Mersana Therapeutics, Inc. and Arvin Yang, dated November 5, 2020 (incorporate by reference to Exhibit 10.2 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on May 10, 2021).
10.22†	Offer Letter, dated March 5, 2021, by and between Mersana Therapeutics, Inc. and Alejandra Carvajal (incorporated by reference to Exhibit 10.5 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on May 9, 2022).

10.23†	Offer Letter, dated June 15, 2021, between Mersana Therapeutics, Inc. and Tushar Misra (incorporated by reference to Exhibit 10.6 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on May 9, 2022).
10.24*†	Offer Letter, dated July 20, 2021, between Mersana Therapeutics, Inc. and Mohan Bala.
10.25†	Retirement and Separation Agreement, dated September 5, 2023, by and between Mersana Therapeutics, Inc. and Anna Protopapas (incorporated by reference to Exhibit 10.3 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on November 7, 2023).
10.26†	Offer Letter, dated September 5, 2023, by and between Mersana Therapeutics, Inc. and Martin Huber (incorporated by reference to Exhibit 10.4 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on November 7, 2023).
10.27†	Letter Agreement, dated September 6, 2023, by and between Mersana Therapeutics, Inc. and Arvin Yang (incorporated by reference to Exhibit 10.5 to the Quarterly Report on Form 10-Q (File No. 001-38129) filed with the SEC on November 7, 2023).
10.28†	2007 Stock Incentive Plan, as amended (incorporated by reference to Exhibit 10.19 to the Registration Statement on Form S-1 (File No. 333-218412) filed with the SEC on June 1, 2017).
10.29†	Form of Incentive Stock Option Agreement under the 2007 Stock Incentive Plan (incorporated by reference to Exhibit 10.20 to the the Registration Statement on Form S-1 (File No. 333-218412) filed with the SEC on June 1, 2017).
10.30†	Form of Nonqualified Stock Option under the 2007 Stock Incentive Plan (incorporated by reference to Exhibit 10.21 to the the Registration Statement on Form S-1 (File No. 333-218412) filed with the SEC on June 1, 2017).
10.31†	2017 Stock Incentive Plan (incorporated by reference to Exhibit 10.22 to Amendment No. 1 to Registration Statement on Form S-1 (File No. 333-218412) filed with the SEC on June 16, 2017).
10.32†	Form of Incentive Stock Option Agreement under the 2017 Stock Incentive Plan (incorporated by reference to Exhibit 10.23 to Amendment No. 1 to Registration Statement on Form S-1 (File No. 333-218412) filed with the SEC on June 16, 2017).
10.33†	Form of Non-statutory Stock Option Agreement under the 2017 Stock Incentive Plan (incorporated by reference to Exhibit 10.24 to Amendment No. 1 to Registration Statement on Form S-1 (File No. 333-218412) filed with the SEC on June 16, 2017).
10.34†	Form of Restricted Stock Unit under the 2017 Stock Incentive Plan, for awards granted prior to April 2023 (incorporated by reference to Exhibit 10.1 to the Quarterly Report on Form 10-Q (File No. 333-38129) filed with the SEC on August 6, 2021).
10.35†	Form of Restricted Stock Unit Agreement for Employees under the Mersana Therapeutics, Inc. 2017 Stock Incentive Plan, for awards granted after April 2023 (incorporated by reference to Exhibit 10.2 to the Quarterly Report on Form 10-Q (File No. 001-23819) filed with the SEC on August 8, 2023).
10.36†	Form of Restricted Stock Unit Agreement for Non-Employee Directors under the Mersana Therapeutics, Inc. 2017 Stock Incentive Plan, for awards granted after April 2023 (incorporated by reference to Exhibit 10.3 to the Quarterly Report on Form 10-Q (File No. 001-23819) filed with the SEC on August 8, 2023).
10.37†	2022 Inducement Stock Incentive Plan (incorporated by reference to Exhibit 10.28 to the Annual Report on Form 10-K (File No. 001-38129) filed with the SEC on February 28, 2022).
10.38†	Form of Non-statutory Stock Option Agreement under the 2022 Inducement Stock Incentive Plan (incorporated by reference to Exhibit 10.30 to the Annual Report on Form 10-K (File No. 001-38129) filed with the SEC on February 28, 2022).
10.39†	Form of Inducement Restricted Stock Unit under the 2022 Inducement Stock Incentive Plan, for awards granted prior to April 2023 (incorporated by reference to Exhibit 10.29 to the Annual Report on Form 10-K (File No. 001-38129) filed with the SEC on February 28, 2022).
10.40†	Form of Restricted Stock Unit Agreement under the Mersana Therapeutics, Inc. 2022 Inducement Stock Incentive Plan (incorporated by reference to Exhibit 10.1 to the Quarterly Report on Form 10-Q (File No. 001-23819) filed with the SEC on August 8, 2023).
10.41†	2017 Employee Stock Purchase Plan, as amended (incorporated by reference to Exhibit 10.40 to the Annual Report on Form 10-K (File No. 001-23819) filed with the SEC on February 28, 2023).

10.42†	2017 Cash Bonus Plan (incorporated by reference to Exhibit 10.26 to Amendment No. 1 to Registration Statement on Form S-1 (File No. 333-218412) filed with the SEC on June 16, 2017).
10.43*†	Non-Employee Director Compensation Policy, as amended through December 15, 2023.
21.1	Subsidiaries of Mersana Therapeutics, Inc. (incorporated by reference to Exhibit 21.1 to the Annual Report on Form 10-K (File No. 001-38129) filed with the SEC on February 28, 2023).
23.1*	Consent of Ernst & Young LLP, independent registered public accounting firm.
31.1*	Certification of Principal Executive Officer pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2*	Certification of Principal Financial Officer pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1**	Certification of Principal Executive Officer and Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
97*†	Amended and Restated Clawback Policy
101.INS*	Inline XBRL Instance Document
101.SCH*	Inline XBRL Taxonomy Extension Schema Document
101.CAL*	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document
101.LAB*	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE*	Inline XBRL Taxonomy Extension Presentation Linkbase Document
104*	Cover Page Interactive Data File - the cover page XBRL tags are embedded within the Inline XBRL document (included in Exhibit 101).

* Filed herewith.

** The certification attached as Exhibit 32.1 accompanying this Annual Report on Form 10-K is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of the Company under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, whether made before or after the date of this Annual Report on Form 10-K, irrespective of any general incorporation language contained in such filing.

† Indicates a management contract or compensatory plan.

+ Portions of this exhibit have been omitted pursuant to Item 601(b)(10)(iv) of Regulation S-K.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

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

Mersana Therapeutics, Inc.

Date: February 28, 2024

/s/ Martin Huber

Martin Huber, M.D.
President and Chief Executive Officer
(Principal Executive Officer and Authorized Signatory)

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

Signature	Title	Date
/s/ Martin Huber Martin Huber, M.D.	President, Chief Executive Officer and Director (Principal Executive Officer)	February 28, 2024
/s/ Brian DeSchuytner Brian DeSchuytner	Senior Vice President, Chief Operating Officer and Chief Financial Officer (Principal Financial Officer)	February 28, 2024
/s/ Ashish Mandelia Ashish Mandelia	Vice President, Chief Accounting Officer (Principal Accounting Officer)	February 28, 2024
/s/ David Mott David Mott	Chairman of the Board	February 28, 2024
/s/ Lawrence M. Alleva Lawrence M. Alleva	Director	February 28, 2024
/s/ Willard H. Dere Willard H. Dere, M.D.	Director	February 28, 2024
/s/ Allene M. Diaz Allene M. Diaz	Director	February 28, 2024
/s/ Andrew A. F. Hack Andrew A. F. Hack, M.D., Ph.D.	Director	February 28, 2024
/s/ Kristen Hege Kristen Hege, M.D.	Director	February 28, 2024
/s/ Anna Protopapas Anna Protopapas	Director	February 28, 2024

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Executive Officers

Martin Huber, M.D.
President and Chief Executive Officer, Director

Brian DeSchuytner
Senior Vice President, Chief Operating Officer and Chief Financial Officer

Mohan Bala, Ph.D
Senior Vice President, Chief Development Officer

Alejandra Carvajal
Senior Vice President, Chief Legal Officer

Timothy B. Lowinger, Ph.D.
Senior Vice President, Chief Science and Technology Officer

Tushar Misra, Ph.D.
Senior Vice President, Chief Manufacturing Officer

Directors

David Mott
Chair of the Board of Directors; Private Investor, Mott Family Capital

Martin Huber, M.D.
President and Chief Executive Officer

Lawrence M. Alleva
Former Partner, PricewaterhouseCoopers LLP

Willard H. Dere, M.D
Chief Medical Officer and Chief Advisor to the CEO, Angitia Biopharmaceuticals

Allene M. Diaz
Commercial Strategy and Portfolio Management Consultant, AMD Consulting

Andrew A. F. Hack, M.D., Ph.D.
Partner, Bain Capital Life Sciences

Kristen Hege, M.D.
Former Senior Vice President, Early Clinical Development, Hematology/ Oncology & Cell Therapy, Bristol Myers Squibb Company

Anna Protopapas
Former President and Chief Executive Officer, Mersana Therapeutics, Inc.

Corporate Information

Transfer Agent and Registrar
Computershare Trust Company, N.A.
150 Royall Street
Canton, MA 02021

Form 10-K Requests
Our Annual Report on Form 10-K for the fiscal year ended December 31, 2023 has been filed with the Securities and Exchange Commission, and additional copies are available without charge upon written request by contacting us at our Corporate Headquarters, attention: Secretary.

Corporate Headquarters
840 Memorial Drive
Cambridge, Massachusetts 02139

Common Stock Data
Nasdaq Global Select Market
Symbol: MRSN

Investor Relations
Jason Fredette
SVP, Investor Relations & Corporate Communications
(617) 498-0020
Jason.Fredette@mersana.com

Annual Meeting
Our annual meeting of stockholders will be held on Tuesday, June 11, 2024 at 9:00 a.m. Eastern Time via the internet at www.virtualshareholdermeeting.com/MRSN2024.

Independent Registered Public Accounting Firm
Ernst & Young LLP
Boston, Massachusetts